THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. XVII. No. 417—20th YEAR.] LONDON, OCTOBER 13, 1868. [Subscription per Ann. { 15s. in Advance / 18s. Credit.] DOUBLE No. Price 1s.

RAMSAY'S NEWCASTLE CANNEL
COAL. Analysis by Dr. FYFE, M.D.:—
9746 cubic feet of gas per ton of coal.
26-candle gas.
13¼ cwt. coke per ton of coal.
N.B.—Ramsay's Cannel most resembles the Marquis of Lothian's Cannel, but superior as to coke.
RAMSAY'S PATENT CONDENSED COKE,
DO. GARESFIELD COKE.

RAMSAY'S FIRE-CLAY ARTICLES.
GAS-RETORTS, introduced 1828.
FIRE-BRICK WORKS, established 1804.
FIRE-CLAY SANITARY PIPES, CHIMNEY-TOPS, and all Goods made of Fire Clay.
The Fire Clay is worked from Blaydon Main Colliery, is of excellent quality, and no expense spared in perfecting every article.
The FIRE-BRICKS (marked "RAMSAY") are to be seen in all parts of the world, and the works are the most extensive in the Kingdom.
Manufactories: DERWENTHAUGH, SWALWELL, and HEBBURN QUAY. Offices: BROAD CHARE, NEWCASTLE-UPON-TYNE. Address, G. H. RAMSAY.

GEORGE GLOVER & CO.,
Patentees of the Standard Gasometers for the Government, and of the
IMPROVED DRY GAS-METERS.
These METERS are warranted to measure correctly and not to vary, and have come into general use more rapidly than any Meters hitherto manufactured.
1862.
CLASSES X. AND XXXI.
CLASS X.—"*For ingenuity, completeness, and efficiency of apparatus used in measuring gas, and for excellence of material and workmanship.*"
CLASS XXXI.—"*For superiority of construction and workmanship.*"
Particulars and lists of prices forwarded on application to Ranelagh Works, Ranelagh Road, Pimlico, LONDON, S.W.; 15, Market Street, MANCHESTER; or 127, Boulevard de Magenta, PARIS.

IMPROVED GASLIGHT.
Ample experience has proved that, by carburetting common gas, its illuminating power may be doubled or even tripled, and its consumpt greatly lessened. WAX candles and oil lamps in consequence are being rapidly superseded, and gas is now used in many private houses and mansions where formerly it was not tolerated.
Information as to the apparatus, fluids, &c., may be had of GEO. GLOVER and Co., or CARLESS, BLAGDEN, and Co., HACKNEY WICK, N.E.

COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
BLAYDON BURN, NEAR NEWCASTLE-ON-TYNE,
Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS RETORTS and OTHER OBJECTS in FIRE-CLAY," and they have also been awarded in the INTERNATIONAL EXHIBITION of 1862, the PRIZE MEDAL for "GAS RETORTS, FIRE-BRICKS, &c., for EXCELLENCE of QUALITY."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts in the United Kingdom; and orders for Fire-Clay Retorts of all shapes and dimensions, Fire-Bricks, and every other article in Fire-Clay are promptly executed at their Works as above.
COWEN'S GARESFIELD COALS.
Coal Office,
QUAY SIDE, NEWCASTLE-ON-TYNE.

FIRST PRIZE IN THE PARIS EXHIBITION.

JOHN RUSSELL AND CO.,
THE OLD TUBE WORKS,
CHURCH HILL, WEDNESBURY;
ALMA WORKS,
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and 69, UPPER THAMES STREET, LONDON,
Original Manufacturers of Wrought-Iron Gas Tubes and Holders of the present Patents; Inventors and First Makers of LAP-WELDED FLUES for Steam Boilers.
J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water, and the largest Orders may be executed in a few days.
Gun Metal, and all other kinds of Cocks, Stocks, Dies, and Taps, Galvanised Tubes, &c.
N.B. All Goods thoroughly Tested before sent out, and Warranted.

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AND
STREET-LAMP
MANUFACTURERS,
BELL BARN ROAD, BIRMINGHAM.
ESTABLISHED 1830.
All materials found for the alteration of Public Lamps for lighting with the Rod. Regulators with Lava Burners.

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These Cannels are extensively used in the Gas-Works of Edinburgh, where the illuminating power of the gas is the highest in Britain.
The yield per ton is **12,573** cubic feet; illuminating power 33·8 standard candles; coke per ton 1046 lbs.
Ports of Shipment, in the Firth of Forth.

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For prices and other information, apply to Mr. JOHN ROMANS, C.E., 53, Frederick Street, EDINBURGH.

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JAMES FERGUSON & CO., Auchinheath Colliery, Lesmahago, and the NITSHILL & LESMAHAGO COAL COMPANY, AUCHINHEATH AND SOUTHFIELD COLLIERIES, LESMAHAGO, sole Proprietors and Producers of the above celebrated GAS COAL, beg to intimate to Gas Companies and other consumers that, having reason to suspect that Cannel or other Coal of very inferior quality, both as regards the quantity and illuminating power of the Gas, has frequently been mixed with and sold under the name of "Lesmahago," they have now appointed Messrs. JAMES LAWRIE & Co., of 63, Old Broad Street, LONDON, E.C., sole agents for England; and Messrs. LA COUR & WATSON, of LEITH, sole agents for foreign markets; and, in order to prevent a recurrence of the frauds named, they request that all purchasers will send their orders through the above-named firms. Orders for other than the above-named markets may be forwarded direct to either of the Proprietors.
The Proprietors will, in future, use their own forms of bills of lading, and also issue certificates of origin, signed, as the case may be, either by JAMES FERGUSON & Co., or by the NITSHILL & LESMAHAGO COAL COMPANY; and they request all consumers purchasing Lesmahago Coal to demand such a certificate for each cargo, and to observe that it corresponds with the bill of lading.
Auchinheath, Lesmahago, March, 1868.

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Patentees of the Standard Gasometers for the Government,

TWO MEDALS,

LONDON, 1862.

HAVE OBTAINED THE
HIGHEST
PRIZE
FOR

SILVER MEDAL,

PARIS, 1867.

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AT THE
PARIS EXHIBITION.

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The following are taken indiscriminately from a number of testimonials as to the merits of the Fire-Clay and Cast-Iron Ribbed Retorts:—

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Sir,—We have had 15 of your Ribbed Clay Retorts in use at these works for the past twelve months. I am happy to be able to report favourably of them. It appears to me that the Ribs afford additional strength to the Retort, whilst they render the charge porous, so that the gas is more freely disengaged from the coal, and the deposit of carbon does not take place to the same extent that it does in plain Retorts. I believe the principle of construction applied to your Retorts may be adopted for Fire-Brick Retorts and Ovens, and with results equally beneficial.—I am, sir, yours faithfully, J. L. Cocker, General Manager.

Gaslight Company, Shrewsbury, Oct. 8, 1868.

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For further particulars, apply to A. C. Fraser, Gas-Works, Colchester.

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SAFES.

Before purchasing send for
GRIFFITHS' MONTHLY LIST OF SAFES,
By Milner, Marr, Thos. Perry and Sons, Mordan, Price, Whitfield, and every eminent maker, at about half the price of new.
A guarantee given with each.
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BRASS & IRON FOUNDERS,
Manufacturers of
BRASS GAS-FITTINGS, CHANDELIERS, &c.,
In various styles; also of
PATENT WELDED WROUGHT-IRON TUBES AND FITTINGS.
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WOOD SIEVES FOR GAS PURIFIERS.

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FOUR-WAY VALVES, one of which is equal to three ordinary Valves.
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"The Author is well qualified to speak authoritatively upon the important subjects to which his pamphlet refers."—*Artizan.*

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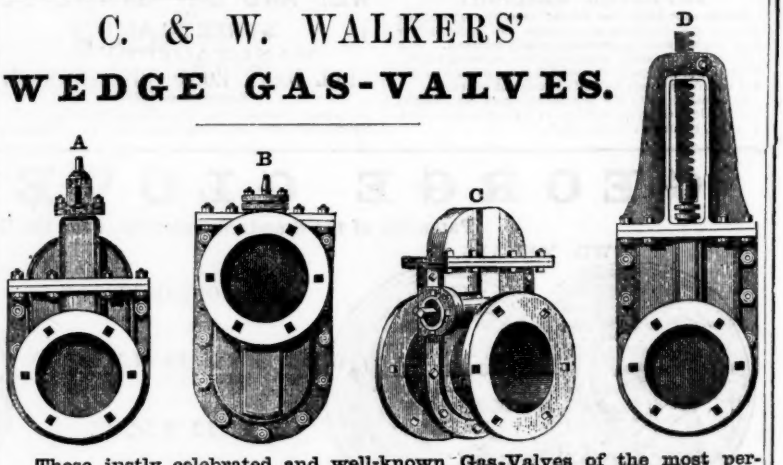
WEDGE GAS-VALVES.



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STATION-METERS ANY SIZE.

PHOTOMETERS, EXPERIMENTAL METERS,

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DEPÔT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and FIRE-CLAY, and every Article suitable for

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HANCOCK'S INDIA-RUBBER GAS-TUBING.

All sizes, from ¼ in. to 4 in. diameter and upwards.

Also,

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WASHERS for GAS and STEAM JOINTS.

VALVES (pure solid Rubber) for STEAM-ENGINES.

PACKING (Elastic) for STEAM-ENGINES.

FLANGE TUBING, for excluding Draughts and Dust through WINDOWS, DOORS, and GLASS CASES.

Section.

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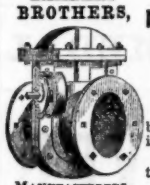

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THE

UNIVERSAL EXHIBITION OF PARIS,

1867.

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HAVE BEEN AWARDED THE HIGHEST PRIZE FOR

DRY GAS-METERS,

BY THE IMPERIAL COMMISSIONERS FOR THE

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(SUCCESSORS TO SAMUEL CROSLEY),

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STATION-METERS AND GOVERNORS.

Which can be seen at all the London Gas-Works. Also Liverpool, Manchester, Sheffield, Nottingham, Belfast, Glasgow, Birmingham, Dublin, Bristol, Leeds, Leicester, Brighton, Southampton, Sunderland, Wolverhampton, Bradford, Norwich, &c., &c.

TEST GASHOLDERS, EXPERIMENTAL METERS, EXHAUSTER REGULATORS,

MINUTE CLOCKS, PRESSURE GAUGES, PHOTOMETERS, PRESSURE REGISTERS, &c.

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NOTICES.

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THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, OCTOBER 13, 1868.

Notes upon Passing Events.

THE Earl of Carnarvon is a nobleman whose tastes, habits, education, and pursuits are in marked and favourable contrast to many members of his order, whose names are constantly before the public, conspicuous for the lavish profusion with which they dissipate all their time and means in foolish amusements and degrading pursuits, surrounded and applauded by the basest of both sexes. They begin as the kings, they end as the slaves, of gamblers, money-lenders, pimps, and panders. Perhaps those who are rich enough and cunning enough to avoid ruin, and are satisfied to show how frivolously an enormous income can be spent, are even more to be despised than the fools who plunge into ruin amid the cheers of the betting-ring. Lord Carnarvon has never been an idle man; he has laboured hard to educate himself for his high position, and, better still, his sympathies have always been with the humble and the weak; but, like much abler men, he has been obliged to take a great deal of his information at second-hand, and thus it is that at Birmingham his address, as president of the Social Science Society, was marked by some extraordinary blunders. For instance, in Lord Carnarvon's encyclopædic survey of the social condition of this country, he devoted a paragraph to the water supply of London, than which, if suppression of truth be a crime, nothing could be more criminal. That there may be no mistake, we give the noble lord's own words:—

> Nowhere, indeed, can a more important question than that of our water supply be found for discussion, and nowhere has our progress been more unequal, even in the first city of the kingdom. In spite of the Metropolitan Water Act, we are painfully and gradually opening our eyes to the discreditable deficiencies of the water supply of London. Immeasurably inferior to its great type and rival of the ancient world, whose aqueducts, built tier above tier, and striding over the Campagna, still in their very ruins carry their living waters into the heart of Rome; inferior to Marseilles and Lyons abroad; inferior to her own provincial towns, such as Aberdeen and Glasgow, Sheffield and Cardiff, London is provided with a water supply less than health and domestic purposes require, less than the protection of property from fire may justly claim; open, in fact, to objections on the score of quantity, quality, cost, and unnecessary waste. It is true, indeed, that each individual is nominally credited with a consumption of rather more than 30 gallons per day; but, in this case, such an average is deceptive, and practically the poorest class are, in many places, reduced to three or four gallons daily—a pitiful and intermittent allowance, obtained under circumstances of personal hardship.

It is somewhat remarkable that the persons who furnished Lord Carnarvon with the materials for this part of his speech did not, as they usually do, include the names of Manchester, Bradford, Halifax, and Huddersfield as towns in which water was supplied on a model system from reservoirs impounding rain or surface water. The residents in these districts can easily understand the ominous cause of Lord Carnarvon's silence. The (model) Lancashire and Yorkshire towns have, in consequence of the summer's drought, been almost without, and up to the end of last month were still in great straits for, water. Manchester is reported to have been paying £2400 weekly for compensation to the Etherow mill occupiers. On the 19th of September the Manchester Water Committee issued the following circular:—

> The drought still continues, and it has long ceased to be possible to anticipate or speculate with any degree of certainty as to the time when we shall have in this district any rainfall which will materially increase the storeage in the corporation reservoirs, upon which so enormous a population is dependent for the supply of water absolutely necessary for health and comfort.
>
> The drought has now, with little or no material interruption, continued for the unprecedented period of nearly six months, and it is hardly necessary to say that the Water-Works Committee have for many weeks past been compelled to consider in what way the consumption can be reduced, and been watching with the greatest anxiety the gradual but constant diminution of the water in the reservoirs.
>
> As already announced, one-half only of the compensation water required to be sent down the Etherow for the supply of the mills has for some weeks been furnished. A further reduction may become necessary, but unless and until absolutely compelled, the committee are most unwilling further to interfere with such supply.
>
> The committee have every reason to be satisfied with the disposition generally manifested by the occupiers of the mills, for whose benefit such compensation water is secured by Act of Parliament, in every way to meet the corporation under the circumstances of unprecedented difficulty, fully recognizing the fact that, without abandoning their claims to reasonable compensation for any actual loss or extra expense sustained, the supply of water for the requirements of the inhabitants for domestic consumption must and ought to be the paramount consideration with the corporation.
>
> At the meeting of the committee, held yesterday, it was determined to shorten the hours of supply, and to supply water throughout the city and district dependent upon the corporation from and after Monday next, the 21st inst., only between the hours of six o'clock in the morning and two o'clock in the afternoon, and at the same time still further to reduce the quantities of water supplied for trading purposes.
>
> When the inhabitants consider the reports appearing constantly in the papers of the very short period (varying from one or two to three or four hours) during which water is supplied to the inhabitants in neighbouring towns, and in other cases of the entire failure of all supply by the authorities, they have every reason to congratulate themselves that the corporation are, after such a period of drought, and notwithstanding the large demands upon their works, still able to propose to supply water during eight hours of each day, and thereby to afford an ample opportunity to all to obtain the quantity of water absolutely required. How long this great boon may continue in the possession of the inhabitants will, if the drought,

continue, to a great extent depend upon themselves. The utmost economy in the use of water must be exercised. Where any other means of supply, either from existing pumps or otherwise, are available, such means ought, to the largest extent possible, to be made use of, in order to lessen the consumption of the water of the corporation.

The committee have every reason to believe, from the diminished consumption which has resulted from the shortening of the hours of supply, that the inhabitants have willingly and effectively carried out the desire of the corporation that they should exercise the strictest economy in the use of the water, and with such continued co-operation and assistance the committee trust that they may yet be enabled to pass through this most extraordinary ordeal without limiting, to a greater extent than is now proposed, the supply of water to the inhabitants.

We may add, that to such straits are these model water-works reduced, that the committee is actually employing the police to detect cases of waste of water. In the *Manchester Examiner*, of the 28th ult., is the report of a case before the police court, in which the assistant town-clerk prosecuted a man under a section of the Manchester Water-Works Act, which provides "That every person supplied with water by the Corporation "who wilfully or negligently suffers any water apparatus to "be in such a state as to waste or misuse the water, shall "forfeit a sum not exceeding £5." The man was properly convicted. But what a storm of indignation would be raised by Dr. Farr and his friends if the water supply of London were so defective as to require such precautions and such penalties. In Bradford—another model water-works town—ninety thousand people have been absolutely without water, except such as could be procured from long abandoned wells. In fact, the impounding system is a dead failure in that district. Now, as to the towns cited by Lord Carnarvon as models of good arrangement, we say of Lyons and Marseilles only that their supply is of very recent date, and therefore ought to afford all the latest improvements. A very few years ago the inhabitants paid for their water at per pail, and so they do still in many houses. At Aberdeen the supply is taken, like that of London, from a river—the Dee. At Glasgow, they are fortunate enough to have Loch Katrine close handy; if London had the same advantage, the water companies would require no pressing to employ such a perpetual reservoir. At Cardiff, a company takes its supply from the river Ely. At Sheffield, the impounding reservoirs have been so reduced that they have been compelled to discontinue the compensation waters, and are paying the millowners large sums weekly for the stoppage. Thus the Board of Health impounding system has everywhere failed (although it is not the fault of Mr. Edwin Chadwick that London is not now dependent on the gatherings of the Surrey Hills and Bagshot Sands), while the supplies drawn from rivers or pumped from deep wells, as at Sunderland, Nottingham, Coventry, Birkenhead, and part at Birmingham and Liverpool, have never failed. The water supply of London has yet to be further protected by the interception of the sewage of all the towns upon the banks of the Upper Thames. But, as it is, the great drought has tested it and proved it to be, although capable of improvement, especially by the introduction of "constant supply," superior to the latest models in quality and quantity. It is unfair to pass over the fact that the inhabitants of London have for more than a century enjoyed a house-to-house supply, while all the cities of France and Germany, as well as Liverpool, Manchester, and Birmingham, were dependent on water at a half-penny a pailful doled out by carts and carriers. Lord Carnarvon did not say one word about Paris, where, with millions expended on external splendour, and water flowing in fountains and over the streets, a water-tap in a house is an exceptional luxury even on the ground floor. This one-sided statement will surely be regretted by the social science president when he learns how partial was the brief placed in his hands by the advocates for making a clean sweep of all existing works, and expending uncalculated millions on supplies from some unknown source of fabulous purity. We venture to prophesy that the inhabitants of London will be receiving their daily constant supply of water from the Thames when the schemes of the levelling water quacks are forgotten.

There is a class of writers to be found in such respectable journals as the *Economist* and *Spectator*, who, deriving their impressions much more from books than from intercourse with men, follow in social matters the strictly logical conclusions of French and German politicians of the reddest type. That is, they propose to begin by sweeping away all the manners and customs of the English, and remodelling the nation on the same foreign type. For instance, a writer in the *Economist*, the other day—a bachelor, we should say, much given to study, who finds a third floor in the centre of Paris more convenient for his studies and amusements than a cottage or a lodging in the suburbs of London—gravely suggests that Englishmen would be very much improved by adopting the tastes and manners, not of Frenchmen, but of Parisians. For instance, he observes that, as French couples have fewer children than English, the population of France does not increase so fast as that of England, and therefore it has not to work so hard as we have, having fewer mouths to be provided for. This may be true, but does this childless husband or unmarried man imagine that the hint will have any effect on the masses of England, or any kindred Teutonic nation? Next, the *Economist* writer expresses his preferences for Paris concentrated in flats, rising to the seventh and even to the tenth storey, to London and England, where every man who can, prefers to live in a separate house. Thus London becomes one of the most straggling cities in the world, surrounded by a belt of garden suburbs, besides dotting the home counties with cottages and villas. Taste apart, the flat is rendered more comfortable in Paris by other habits besides those of limiting the family. It is the custom with all who can afford it to send their young children to nurse in the country. This is so universal that the tailor sent by the Society of Arts to see the French Exhibition found it adopted by his French brother journeymen tailors, and admired it as much as the "habit of "French ladies not to have more than two or three children." Then it is very much the custom of the middle, lower middle, and working classes, even when married, not only to dine, but spend the evening out, and only return to their dwelling to sleep. The custom of asking a friend to dinner without ceremony is unknown in Paris, and, except amongst the very rich, dinner parties are rare. As to that ordinary institution of England—the spare bed for a friend—that is almost unknown in France. Hospitality is not a French virtue, although there are very hospitable Frenchmen. For these reasons, Frenchmen of equal fortune to Englishmen—not exceeding, say, £1000 a year—require much fewer rooms and less servants. No nursery, no spare bed, no dining-room in our sense, and all the furniture concentrated in a drawing-room, makes it much more easy to live in a suite of apartments. Of course, to artists, students, and all who are fond of society, music, the theatre, association with persons of the same tastes, and who are either indifferent to the table or prefer public breakfasts and dinners at *restaurants*, Paris, with studious life within doors and gay life out of doors, is perfection. But take an Englishman, whether a skilled artisan, or a clerk, or a tradesman, or a professional man, and you will find that his ideal of comfort after the work of the day is no more the Frenchman's than his idea of a daily dinner. A man must be educated at leisure and travelled to appreciate a first-rate French dinner. A common French dinner is detestable to an English workman, because he hates the foundation of its economy—soup, and meat boiled to rags. Salad he does not understand, and has no idea of vegetables, however finely cooked, unless there is a piece of solid meat as an accompaniment. Thus it is that the higher classes in England have learned much from the French school of cookery and the French style of house-building, but the middle classes like neither. The house work of an English house is so great that it robs the kitchen of the daily attention French servants with very few rooms and very little furniture to keep in order, can bestow on it. The preparation of a salad for the dinner of a thriving French tradesman would occupy the cook an hour.

The *Economist* writer, after incidentally giving the French credit for the most intellectual motives in their preference for life in the library, the studio, the *estaminet*, or the *café-restaurant* of a large town, assumes that the Englishman lives in a separate house, away from amusement, society, and improvement, because he has pride in standing on his own threshold, and not because he likes to nurse his own children, dine with his own wife, entertain his friends on Sunday or at supper, and take a friend from the country into a spare bed. But perhaps there are other reasons. We have a moist climate, and universally burn coal. Perhaps a good many seek the suburbs for purer air, white linen, and for the exercise of a daily walk to and from business. Growing crocuses and cabbages in a plot of garden is not a very intellectual pursuit, but it is quite as intellectual as dominoes or any game at cards at a *café*. Formerly, in the City of London all the shopkeepers lived over their shops, and met at their clubs at taverns in the evening. Facilities of conveyance have carried them all into the country. This would seem as if that which is, no doubt, most for the happiness of Frenchmen is not the

English idea of happiness. The severe censor of our manners already quoted, attributes the love of the country which has dotted the land with so many mansions, villas, and cottages, more exquisite in taste and complete in finish than any that foreigners have produced, to love of the importance an Englishman may obtain by becoming a justice of the peace, or the amusement of "preserving small animals and birds "to be killed." But although there is no doubt that a Frenchman who has made money flies from the country, where he is not only of no importance, but under the thumb of every paid functionary, however humble, and the object of the jealousy and spite of peasant proprietors, to Paris, where money brings much pleasure, an idea of importance from display of wealth in houses, horses, carriages, jewellery, and mistresses, that cannot be obtained in England, not all, nor nearly all those who live in the country devoted to fancy farms or gardens, great or small, are either squires, magistrates, or game preservers. The little game-preserving squire is often a very absurd person, but it may be questioned whether, as a rule, he is not more useful than if he had migrated to a flat in Pimlico, left his duties to a stipendiary magistrate, his dignity to be supported, as in France, by a superintendent of police, and his subscriptions to schools and charities to be paid out of the taxes. A crowd of people live round London, Liverpool, Manchester, and Birmingham, on from half an acre to 500 acres, who are neither squires nor magistrates, nor people of any importance in any way, but live in the country because they like air, exercise, gardening, farming, and rural sports—tastes few Frenchmen, not of high education, could understand. Therefore we suspect that life in Paris may be more intellectual for those who are intellectual, but that our rural tastes are more favourable to the general progress, civilization, and liberty of the nation, for they encourage healthy, wholesome pursuits, promote agriculture, and discourage paid functionaries.

With respect to the merits of the two nations as regards the comforts of life, the comparison cannot be parallel, in consequence of the difference in the tastes of the two people. An Englishman requires that his house shall be well drained, with fresh air obtainable, plenty of water, and a good fire, round which he can gather his family. The Frenchman's pleasures are out of doors, in a crowd. He has brought co-operation in public places of amusement and refreshment to perfection. With respect to dress, whether as seen in the shop-window of a silk-mercer or on a lady, the superiority of a Frenchwoman's taste over an Englishwoman's is evident the moment that either indulges in brilliant colours, and cannot be questioned. It is only on the French stage that actresses are all consistently well dressed. A few years ago, as testified by the celebrated portrait of Lady Mary Craven, in a walking-dress of dark stuff looped up over a scarlet petticoat, with real walking Balmoral boots and useful becoming hat, a really pretty and sensible costume was produced of English design. But, carried to France, the hat was spoiled by ornaments, and the rest of the costume converted from one fit for a walk in the woods or on the moors to something only suitable to a very fine and lazy lady. As regards taste and utility in the dress of men, as a writer in a daily paper observed the other day, the English are the arbiters of fashion in Europe, unless it be in the drawing-room. Englishmen like exercise for the sake of exercise, and not to be seen or talked about in a fancy costume; so our Tweed shooting suits, our Knickerbocker breeches, our woollen cord breeches, with hunting-boots, and our famous strong-soled yet neat shooting and walking boots and shoes, are models which all European gentlemen adopt, for Englishmen are essentially the well-dressed men of Europe. French taste is great in nick-nacks and jewellery. Our jewellers are dependent on foreigners for all their best designs. We rarely approach them in cabinet-work carvings, and never in the arrangement of drapery; indeed, wherever art comes into trade our success is only exceptional. But French carpentry is clumsy—fit is not valued or understood. In a drawing-room, where the curtains and carpet are exquisite, and the arrangements full of taste, a painted, gilded door will gape and be closed by a catch and lock of the clumsiest workmanship. French harness and French saddlery, except where closely imitated from the English, are coarse and rude. The English mechanic is as superior to the Frenchman in combining strength and elegance in implements and machinery as the French cabinet-maker or stone-carver is superior in taste and design to his English brethren. Boulogne, so near to England, is a capital example of the difference between the two countries. The Imperial Government and the municipality, under the direct influence of the Government, have spent a great deal of money in improving this town, and it certainly is brighter, more open, and more imposing than any of our bathing towns. The appearance of Brighton is dull compared with Boulogne, so clean, so gay, so white and green, with its splendid public rooms on the sea-shore; but, when we examine the French town, we find cesspits and cellars full of sewage; stinks universal, of course; the harbour at low water fit to breed a pestilence; a very inferior water supply; and, most remarkable of all, although funds have been liberally found for the superficial decoration of the town, it has taken nine years to find the money and to build the much-needed and easily constructed docks. In England, Liverpool, Bristol, Hull, Cardiff, and every other commercial town, has managed to construct docks without Government assistance. Should we be happier packed in towns, with the country left in the condition admired by the *Economist*—an army of peasants cultivating from hand to mouth, commanded by a staff of functionaries? Mr. John Stuart Mill attributes our disinclination to the light pleasures of the French to the depressing breath of Puritanism. He forgets that Froissart said of us, while we were still all good Roman Catholics, "*Ils s'amusaient tristement à leur manière.*"

There has been a serious difference between Holland and Belgium regarding the execution of a great public work, of which our journals have taken very little notice. Holland has lately completed the damming up of one mouth of the Scheldt, and opened in its stead another artificial canal. The Belgian Government protested against those works while they were in course of execution, on the ground that treaties guaranteed the free navigation of the two branches of the river, and that the dams would so turn the current of sand as to stop up the channel leading to Antwerp. Two engineers—a Frenchman and a Prussian—declared that the dams would do no harm; the English engineer of the works at the mouth of the Danube held a contrary opinion. At any rate, while diplomatists were arguing, the works were pushed on until completed. The truth is, that what the Belgians really feared, and what the Dutch really wanted from these works, neither frankly declared. The dams are to carry a railway, which, starting from Flushing and Middleburgh, will join the German lines, and may divert trade from Antwerp and other Belgian cities, and it was to this railway, and not to the closing of the Scheldt, that the Belgians objected. The Dutch, on the other hand, might have substituted for the solid dam an iron bridge (such as we have taught foreigners how to make), but they required a solid embankment to assist in reclaiming 80,000 acres of land. At any rate, the works are complete, and the Hollanders have achieved one more victory over their eternal enemy—the water; Haarlem Lake, thanks to English pumping apparatus, is now all farms and cattle pasture. After this success, even the Zuyder Zee is threatened with a project for converting it into dry land. The Dutch have done these important works, including the construction of a canal uniting Amsterdam with the sea at the nearest point, with none of the fuss that accompanies the partial completion of some of the stock-jobbing speculations of other continental states. We are, however, happy to find that the Antwerpians are sufficiently confident in their commercial arrangements not to be alarmed by Dutch competition.

Circular to Gas Companies.

The long-expected report of the Gas Committee of the Metropolitan Board of Works on the gas supply of London is not, after all, likely to be forthcoming, for it appears, from the statements of some members of the Board to their constituents, that at a meeting of the committee of the whole Board they could not agree on the question whether they should take any measure at present to interfere with the supply of gas, the numbers on each side being equal, and the chairman having declined the responsibility of giving the casting vote. Under these circumstances Mr. Newton and Mr. Richardson, two of the members who desire that immediate action should be taken in the matter, have given the following notice of motion:—"(1) That in the opinion of the Board it is expedient that the "manufacture of gas should, as far as practicable, be removed "from the populous districts of the metropolis; (2) that the "Board should promote a Bill empowering them to supply gas "to the metropolis; (3) that, if it be desirable to take the

" existing companies, they should be compensated, the terms " of such compensation to be, if possible, agreed on between " the Board and the companies; (4) and that the matter be " referred to the Special Gas Committee, with authority to " obtain the needful advice and take the necessary steps for " the preparation of parliamentary notices and of a Bill to be " introduced into Parliament during the next session; (5) these " powers, however, not to be sought if the companies will " agree on such a price and such regulations as to the supply " of gas as shall be satisfactory to Parliament." By adopting the technical form of considering the matter in a committee of the whole Board, the public were excluded from hearing the discussions, which concluded without any result, for by resolving themselves into committee the Board may carry on their deliberations with closed doors. The discussion in secret, by the adoption of that form of proceeding, of important questions in which the public are interested, is much to be deprecated, since it tends to encourage jobbery and to diminish the confidence which ought to be placed in the decisions of the Board. By a little extension of the objectionable practice they might, indeed, exclude the public altogether from their deliberations. As the matter at present stands, the motion of Messrs. Newton and Richardson, the consideration of which has been adjourned to Friday next, the 16th inst., will be discussed with open doors, and it may be expected that the most influential members of the Board will take part in the discussion. The resolution is very comprehensive and various, and might be advantageously separated into the five parts into which we have numbered it, for some of the propositions might meet with general assent while to others the strongest objections might be urged. There can, for example, be little difference of opinion as to the expediency of removing the manufacture of gas from populous districts of the metropolis, as far as such removal is practicable; but immediately connected with that proposition comes the very questionable affirmation that the Board should promote a Bill to empower them to supply gas to the metropolis. That affirmation, though immediately following the first proposition, has no relation to it whatever, and is an utter *non sequitur*, though evidently intended to be correlative. Why the Metropolitan Board should be empowered to supply gas to London because it is expedient to remove the manufacture from populous districts, it is difficult for ordinary logicians to comprehend; but we must presume there is some mystical connexion between the first and second propositions, apparent to the minds of the concoctors of the resolution, which may be elucidated in due time, if the public be permitted to hear the discussion. The third proposition is put forth very dubiously. We are told by one of Shakespeare's clowns that there is "much " virtue in an *if;*" it may, therefore, be assumed that there is much greater virtue in the two "if's" comprised in the proposition that "*if* it be desirable to take the existing " companies"—meaning, it may be assumed, the works, and not the living members—they should be compensated, and that such compensation should, "*if* possible, be agreed on " between the Board and the companies." But surely there is some inconsistency in this proposal to take the works of the existing companies, with the previous affirmation as to the expediency of removing the manufacture of gas from populous districts. There can, however, be no objection to refer that matter to the Special Gas Committee, as proposed in No. 4, but it may be considered by many to be highly objectionable that they should also have authority to expend the ratepayers money for the introduction of a Bill into Parliament during the next session. The concluding proposition is exceedingly ambiguous, and though an "if" is said to be "your only " peacemaker," it does not in this case seem to reconcile section No. 5 with those which have gone before. The words seem to signify that the powers desired are "not to be " sought" if the companies will agree to such terms as will be satisfactory to Parliament; but it does not appear how Parliament is to become cognizant of the matter until applied to. In addition to the incongruities of the compound motion of which notice has been given, it may be observed that, dubious as the desirability of taking the works of the existing companies is considered, there are no other means mentioned of obtaining the required supply, for it is not proposed that the Metropolitan Board should be empowered to *manufacture* gas. It seems to be the desire of the proposers of the resolution to bring a Bill into Parliament similar to that of the Corporation of London Gas Bill of last session, though they have not the manliness to avow their object. Any such intention it is to be hoped will be frustrated by the adoption of the amendment of which Mr. Evans, another member of the Board, has given notice—"That, in the opinion " of the Board, it is not advisable to take measures to promote " a Bill in relation to gas supply during the ensuing session of " Parliament." That amendment, if not carried, will, there is reason to believe, be so strongly supported as to make the Metropolitan Board hesitate to proceed any further in so important an affair in the face of that opposition. There would, indeed, be a great difference in the position of the Board, in undertaking the supply of gas, from that of the Corporation of London. The latter have property on which they could borrow the money that might be required, without throwing any liability on the citizens; whereas the Board, having no property on the security of which they could borrow, would have to raise the money by pledging the property of the ratepayers. Any attempt by the Board to coerce the companies to part with their property on unreasonable terms, or to compel them to accept the terms that were imposed on the three City gas companies, until the result of the experiment of 1870 be known, would, there can be little doubt, be defeated. The views entertained on this subject by the directors of the Imperial Company were strongly expressed at their meeting on Thursday last by the governor and by Mr. Burke. The latter, whose long experience on parliamentary committees entitles his opinion to great weight, observed that, during the thirty years he has been a practitioner before Parliament, there is not a single instance on record in which a Corporation has sought to supply gas or water at the risk of the ratepayers in competition with private companies but the scheme has been rejected; and why, he asked, is it to be assumed that Mr. Cardwell by his dicta is to govern Parliament? He characterized the conduct of the Corporation of London towards the gas companies as most dishonest and disgraceful; and, powerful as Mr. Cardwell's influence in the House of Commons might have been, he felt assured that, if the attempt to coerce the gas companies by the threat of competition had been properly resisted, it would not have succeeded. The weakness of the Chartered Company in yielding to the threats was disapproved, and Mr. Burke tauntingly alluded to the assertion in the recent report of that company—that the precedent would be made to extend to the other metropolitan companies—as indicating that they would wish to see the other companies in the same condition as themselves—like the fox that lost his tail. He declared firmly his opinion that, if the Imperial Company stick to their colours boldly, and fight the question out, whether with the Metropolitan Board or any other body, so long as they have justice on their side, there is a fair and reasonable hope that they will be left under the conditions on the faith of which the shareholders originally subscribed their money. It is not encouraging to the gas agitators in the Metropolitan Board that two other vestries—those of Newington and Lambeth—have strongly pronounced against interfering at present with the supply of gas in London, and against the purchase of the existing gas-works by that Board. The companies might, perhaps, agree to sell, if the terms could be agreed on, or the conditions could be defined on which the valuation was to be made. The arbitration now pending in Dundee, as to the value of the two gas-works in that city, which are about to be transferred to the Corporation, will probably serve as a precedent for the valuation of such property, as all the most eminent gas engineers and valuers are engaged in the case, on which it is expected £15,000 will be expended before a decision can be obtained.

The eminent services rendered by Dr. Letheby during the seventeen years he has been connected with the City of London as gas analyst, were appropriately acknowledged at the meeting of the Court of Sewers on Tuesday last. A resolution, that a vote of thanks should be presented to Dr. Letheby on his resignation of the office of gas analyst for the City, was moved by Mr. Pedler, who drew attention to the many important practical improvements in gas lighting which have been made by him during the time he has held that appointment, including, among others, the means of more accurately testing illuminating power, the method now generally adopted of estimating the amount of sulphur in gas, the improved method of purification, the determination of the best kind of burner, and the pressure at which gas should be consumed to obtain the maximum degree of light. Mr. Bontems, the chairman of the Gas Committee, in seconding the vote of thanks, expressed the fullest confidence in the ability and

integrity of Dr. Letheby, and his belief that the Board of Trade could not have made a better appointment to the important office of chief gas examiner, in which opinion all those who know Dr. Letheby will cordially concur.

Mr. Bontems, at the same time that he expressed his satisfaction, in the Court of Sewers, at the appointment of Dr. Letheby, took occasion to advert in different terms to the appointment of Mr. Evans as the chief gas referee. He said he had communicated with the Board of Trade on the subject, inquiring whether Mr. Evans was to retain his office as engineer to the Chartered Gas Company when acting as one of the gas referees; to which inquiry the Board had replied that they saw nothing anomalous in the discharge of the duties required to be performed as gas referee with the position of gas engineer to the Chartered Company, and that there was no reason why the public should not have confidence in such an appointment. That reply was evidently considered not satisfactory by the court, and further action is intended to be taken in the matter.

It appears, from the letter of a correspondent in another column, that a second gas-work is likely to be established in Maryport, to be paid for out of the funds of the Town and Harbour Trustees, who have manœuvred so adroitly—not to use a stronger term—as to have obtained parliamentary powers for that purpose without being compelled to purchase the works of the existing company. It is difficult to conceive mismanagement more damaging to the interests of the company than allowing a Bill conferring such powers to pass, and then haggling about the terms on which they are willing to sell their works. The only alternative of the company now appears to be to accept the offer of the trustees of £10 per share (£14 paid), or to fight the battle out in the streets, which has been done in the neighbouring town of Whitehaven, under the disadvantage of having no statutory powers for opening the streets, while the trustees have such powers.

We have received a very satisfactory report of the working, during the first quarter, at Folkestone, of average meter indication applied to the public lamps, with Sugg's regulators attached to every lamp. The change has given satisfaction to all parties—to the public, the Corporation, and the gas company—a concurrence of opinion not often attained in such matters.

The stagnation in the mineral oil trade of this country, consequent on the low price of American petroleum, has caused such a diminution in the demand for cannel coal for the purpose of manufacturing oil, that Boghead, which last year was quoted at 50s. per ton, has recently been offered at 29s. without meeting purchasers. Wigan is the only cannel that has not been much affected by the influx of petroleum, for it has been almost exclusively used for gas-making, and only a small portion of it has been used for the manufacture of oil.

Correspondence.

MARYPORT GAS.

SIR,—It appears to me, from the last notice of the state of gas affairs in Maryport, contained in your "Circular to Gas Companies," that you are not acquainted with the latest phase it has assumed. The company have, it appears, consulted Mr. Newton (Cawley and Newton, I presume), of Manchester, who advised them to offer their works to the Town and Harbour Trustees for £12 per share. This was accordingly done, and forthwith declined, with a renewal of the offer of the trustees to give £10 per share, the company paying its own mortgage debt of £600; and, as 671 shares have been issued, the purchase-money would have amounted to only £6710, against the £9394 paid up by the shareholders and £11,000 originally asked. Accompanying the refusal of the company's offer by the trustees was a resolution authorizing Mr. Flintoff to prepare plans and specifications for a new work, at a cost of £50, and a further charge of 2½ per cent. on their cost for superintending their erection; and this is the position in which the matter now stands.

Whitehaven, Sept. 30, 1868. A CONSTANT READER.

Register of New Patents.

22.—JAMES SEPTIMUS COCKINGS, of Birmingham, in the co. of Warwick, civil engineer, and FERDINAND POTTS, also of Birmingham aforesaid, manager of works, for "*Certain improvements in welded iron tubes for gas and other purposes where strength and lightness are required.*" Provisional protection only obtained. Dated Jan. 3, 1868.

These improvements consist, first, in making welded tubes of various sizes of iron rolled with lengthway ribs either on one or both sides, whereby all necessary strength is preserved with a great reduction of weight. Second, the improvements in relation to such tubes consist in partially contracting the ends of such tubes after welding, computing such contraction from the face of the ribs, when the tubes are made with the ribs outside, or from the intermediate or reduced parts when the ribs are made up on the interior of the tubes; and in connexion with such contraction the inventors purpose, when required, protecting the end of the tube by the use of a collar while inserting a ribbed drift to drive the recessed portions outwards, so as to equalize the surface of the tube at the end for the better ensuring of sound tapping or screwing.

40.—EUGÈNE GOURDIN, of 113, Boulevard Sebastopol, Paris, merchant, for "*Improvements in the modes or methods of combining a lamp or lighting appliance with a cane or walking-stick.*" Provisional protection only obtained. Dated Jan. 6, 1868.

The idea of making canes or walking-sticks carry in their upper part an agent or appliance for lighting is not new, but no practical and simple mode of combining an appliance for lighting with a cane or stick has hitherto been introduced. This invention consists in certain modes of combining a lamp or lighting appliance with a cane or walking-stick. The main feature consists in lodging the lamp partly in the cane and partly in the handle, and fixing it therein, so that the attachment is secure, and the taking off of the handle easy, while at the same time there is perfect hermeticity, to prevent the gaseous vapours either escaping to the interior of the cane, or issuing therefrom. The chief parts of the attachment are a threaded socket and a caoutchouc washer.

49.—CHARLES HUTCHINSON, of Tufnell Park Road, Holloway, in the co. of Middlesex, for "*An improved liquid-meter tap.*" Provisional protection only obtained. Dated Jan. 7, 1868.

The object of this invention is to produce a tap by which small quantities of liquids may be measured as they are drawn from the containing vessel, and thus to dispense with the necessity for first drawing the liquid into separate measures, and to save the waste and inconvenience consequent therefrom. For this purpose the body of the tap is formed with a horizontal plugway, with a top, bottom, and side openings therein, and the same is fitted with a three-way plug. Underneath the plugway, where the bottom opening is made, is placed the bib, and above the top opening a small funnel-shaped cone. In this cone is fixed a glass cylinder, which is made with a dome-shaped top, with a small perforation therein for the ingress and egress of air. The glass cylinder is graduated by marks to indicate the quantities to be measured thereby. By turning the plug till the third or lateral opening is upwards, the liquid from the container will flow into a glass cylinder, in which the quantity can be measured by the graduated scale marked thereon; by then turning the plug until the lateral or side opening is downwards, the measured liquid in the cylinder or tap-meter will flow out into the receiving vessel.

61.—JAMES LEE NORTON, of Belle Sauvage Yard, Ludgate Hill, in the City of London, and WILLIAM HENRY BAILEY, of the Albion Brass-Works, Salford, in the co. of Lancaster, brassfounder and steam-gauge manufacturer, for "*Improvements in apparatus for indicating and recording the fluctuations of the pressures and temperatures of liquids and fluids.*" Patent dated Jan. 7, 1868.

For recording the pressures of steam or other fluid, any gauge may be employed which indicates the pressure by a revolving pointer, and motion is transmitted from the axis of the pointer (by a wheel or pinion fixed thereon) to a rack capable of sliding endwise to and fro. The rack carries at one end a pencil, the point of which bears against the circumference of a drum, the axis of which is parallel with the line of movement of the rack. A revolving motion is transmitted to the axis of the drum by clockwork in the ordinary manner. If an ordinary Bourdon pressure-gauge be employed, in which the end of the bent tube gives motion to a lever carrying a quadrant which gears with, and gives motion to, a pinion on a central pivot, the pivot is carried through the back of the case, and a wheel is fixed on it as large in circumference as the length of the drum, or of the paper on the drum (if paper be used for receiving the indications). This wheel works to and fro with the varying pressures, and, actuating the rack, the pencil at the end of the rack will trace a line on the drum which can be read when the paper is removed. If air be exhausted from the tube of the gauge, the pressure of the atmosphere, or what is termed vacuum, will be indicated, thus making the same instrument, with a slight alteration of the rack, into a self-recording barometer, or of a vacuum created for mechanical purposes.

71.—FREDERICK FRANCIS OMMANNEY, of Salford, in the co. of Lancaster, engineer, and EDWARD SCOTT, of the city of Manchester, in the same co., engineer, for "*Improvements in forcing and raising water for feeding boilers, and for other similar purposes.*" Provisional protection refused. Dated Jan. 8, 1868.

This invention relates to pumps for feeding boilers, and forcing and raising water from low to high elevations, and consists in exhausting the exhaust steam from the steam-cylinder which drives the pump into the water-main from the pump to the boiler. When desired, the steam is delivered from the steam-cylinder of the pump into the suction-main.

78.—WILLIAM EDWARD KENWORTHY, of Crown Point Road, Leeds, in the co. of York, agricultural chemist and oil merchant, for "*Purifying drains and sewers.*" Provisional protection only obtained. Dated Jan. 8, 1868.

This invention relates to means of purifying drains and sewers by extracting and burning all the noxious gases therein contained. This result is accomplished by connecting pipes to the drains or sewers, which pipes are placed in communication with the furnaces of steam-boilers suitably disposed. In this manner the gases are drawn up through the pipes from the drains and sewers by the furnace draught, whereby to effect their entire combustion in the said furnace, but

should any of the gases still remain, they will be at once absorbed or taken up by the carbon or flue-dust contained in the flues around such boilers.

108.—NATHAN HODGSON, of New Barnet, in the co. of Hertford, machinist, for "*Improvements in engines to be worked by water pressure, compressed air, or other elastic fluid.*" Provisional protection only obtained. Dated Jan. 11, 1868.

This invention has reference to a former patent granted to the present patentee March 23, 1865 (No. 818). The engine described in the specification of the above-mentioned letters patent consists of a case in which a wheel or centre-piece revolves by the action of the motor on the ends of one or more chambers in which the motor is confined. The pressure of the motor in the opposite direction to that of the engine is counterbalanced or neutralized by being transmitted through certain mechanism in a direct line to the axis. This mechanism, according to the invention above referred to, consists of loose pieces having somewhat the form of a triangle or parallelogram, which are received in suitable spaces formed for them in the wheel or centre-piece, but are immovable therein. The present invention consists in mounting such triangular or other shaped pieces upon pivots or centres upon which they are capable of oscillating, and through which the pressure on the inclined faces of such pieces is transmitted in a direct line to the axis of the wheel, and is thereby either entirely or to a great extent counterbalanced or neutralized; and the inventor forms the spaces in which such triangular or other shaped pieces are placed in such manner that the triangular or other shaped pieces shall be free to oscillate therein, without exerting any pressure except upon their centres of motion.

117.—JOHN MALSBURY KIRBY, of Northampton, in the co. of Northampton, for "*Improvements in the means of and apparatus for generating steam and warming buildings.*" Provisional protection only obtained. Dated Jan. 13, 1868.

According to this invention it is proposed to construct the generator for steam-engines of an oval or egg-formed receptacle of cast-iron about 1½ inch thick; this is supported in masonry, and secured to a plate on the surface thereof by means of bolts and nuts, and a cover fitting a flange of the generator. An injection-pipe is fitted to the centre of the cover, and descends vertically into the generator; this pipe terminates in a rose or fountain delivery, and, being supplied with water from a reservoir, distributes small streams of water to the internal surface of the generator. A furnace is constructed beneath the generator, the fire from which surrounds it, the products of combustion being removed by a flue, the outlet of which is at or near the upper part of the generator. The steam-pipe is set on the cover, and is provided with a safety-valve, a branch-pipe conveying the steam to the engine, and a steam-gauge is also placed on the cover near the steam-pipe.

118.—WILLIAM FIRTH, of Rose Villa, Viewforth, Edinburgh, in the co. of Mid Lothian, for "*Improvements in valves made from india-rubber or other similarly elastic material, the said valves being applicable in the construction of fluid or gaseous pumps, enemas, syringes, spray producers, and other instruments where valves are in use.*" Patent dated Jan. 13, 1868.

This invention consists, first, in the construction of valves out of blocks of india-rubber, such valves being capable of forming fluid or gas tight joints by contact, and being applied without extraneous fastening; second, in the construction of valves from cylindrical blocks of india-rubber, with cuts in them to form openings for the passage of fluid or gas, such valves also forming fluid or gas tight joints by contact; third, in the construction of valves similar to those last referred to out of different forms of india-rubber blocks; fourth, in the construction of valves in a series of hard and soft rubber rings, or india-rubber and metal rings, with cuts in or between them to form openings; and lastly, in the construction of valves in a series of hard and soft rings, either bound together at intervals with openings between, or combined so as to admit of being moved wholly from each other to suitable distances, as required, in order to provide outlets for fluid or gas between such rings all round.

138.—JOSHUA KIDD, of St. Paul's Wharf, in the City of London, engineer, for "*Improvements in obtaining artificial light, and in apparatus employed therein.*" Patent dated Jan. 15, 1868,

This invention consists, firstly, in effecting the increase of the illuminating power of a jet or flame of gas or of hydrocarbon vapour, or of mixtures of the same when used alone or in combination with atmospheric air, by causing such flame to issue from a finely perforated jet or burner, such as a fishtail or bat's-wing burner, placed at an angle of about 45° below a horizontal plane.

Secondly, in causing the vapour of heavy oils, or of hydrocarbons which have a high boiling-point, to be generated in boilers, or stills, or other vaporizing apparatus, and to issue therefrom under pressure, and then causing the vapour so escaping, and when ignited, to impinge upon a circular disc constructed of metal, or fire-clay, or other refractory material, such disc being placed at a regulated distance from the jet orifice. When employing such an arrangement, and when greater brilliancy is required, a stream of oxygen gas may be employed as a substitute for atmospheric air, and may be mixed with the before-mentioned hydrocarbon vapour when issuing from the jet or aperture, or when impinging upon the disc.

Naphtha or light burning oils may be used for the purposes of this invention, but the materials which have been found most suitable for the production of the before-mentioned hydrocarbon vapour, on account of their cheapness, are the heavy or dead oils of tar, creosote, naphthaline, heavy oils of petroleum or coal, and other similar fixed oils which are now of small commercial value for the purposes of illumination. If desired, those heavy oils may be freed from solid carbonaceous matter by condensing the vapour generated in the retort. Oil thus prepared will not foul the vaporizer, and may be used for increasing the lighting properties of coal gas.

142.—JASON EGGLETON, of 22, Old Town, Clapham, in the co. of Surrey, for "*Improvements in the manufacture of 'bellows regulators' for water-closets.*" Provisional protection only obtained. Dated Jan. 16, 1868.

This invention consists in making bellows regulators of simple construction, and of materials of such a nature as to prevent their getting out of order, and being affected by damp or liability to decay. These regulators are to be attached to the lever of the valve in the usual way, and are to be constructed entirely of brass and india-rubber. The spindle or rod which runs through the centre, and the plates top and bottom, are of brass, and the intermediate or bellows portion of india-rubber; this combination forms an air-valve.

146.—CLINTON EDGCUMBE BROOMAN, of the firm of Robertson, Brooman, and Co., of 166, Fleet Street, in the City of London patent agent, for "*Improvements in gas heating and cooking apparatus.*" A communication. Patent dated Jan. 16, 1868.

This invention relates to improved arrangements of apparatus for heating and cooking by gas, and the invention combines simplicity of construction, convenience of use, complete combustion of gas, and freedom from disengagement of bad odours. The three essential parts of which each of the apparatus is composed are a gas-burner, or set of gas-burners, straight or curved, which constitutes the source of heat; a chamber to store this heat; and a reflector or radiator (plain or not), to direct, disperse, or distribute the calorific rays. But the characteristic features of the invention consist, partly, in the combination of double bottoms above gas-burners or lamps, producing a draught with a double current of air for keeping up combustion, and partly in the employment of reflecting surfaces to regulate the dispersion of the heat produced.

175.—BENJAMIN THEOPHILUS MOORE, of Elm Lodge, Spring Grove, Isleworth, in the co. of Middlesex, civil engineer, for "*A new or improved apparatus for protecting water-pipes from injury by frost.*" Provisional protection only obtained. Dated Jan. 18, 1868.

This invention has reference to the application to service-pipes for supplying water to houses or other buildings, either by means of cisterns or tanks, or otherwise, of an apparatus consisting mainly of a cock, valve, or plug, so arranged that, when frost occurs, such cock, valve, or plug shall automatically close the communication between the main and the service pipe, and shall at the same time effect a communication between the latter and an open branch-pipe, so as to allow the whole water contained at the time in the service-pipe to escape therefrom.

176.—EDWARD DORSETT, of 12, London Street, in the City of London, for "*Improvements in the utilization of coal tar and the products arising from the distillation thereof.*" Patent dated Jan. 18, 1868.

This invention has for its object improvements in the production and utilization of the heavy mineral oils which are produced by the distillation of coal tar, cannel, Boghead, and other coal and coal shales, and which are known in commerce as coal oil, dead oil, shale oil, creosote, naphthaline, &c. These liquid hydrocarbon matters are employed in the manner hereinafter described: in the first place for their own distillation or production; and, secondly, for the production of heat generally, and more particularly to the heating of steam-boiler and other furnaces. The distinctive modifications of this invention, are—

1. The employment of a separate generator or boiler for the production of vapour from the mineral oils, which said vapour is therein maintained under pressure, which may vary according to the quantity of mineral oil required to be vaporized by the apparatus at from 10 lbs. to 60 lbs. or more upon the square inch, under which pressure the vaporized mineral oil is supplied by pipes in the same manner as steam to a small pipe or series of pipes, each pipe being perforated with from four to six small holes, and which pipes are placed inside each separate furnace of a steam-ship, or under each boiler for generating steam or distilling coal tar and other matters.

2. The continuous action of the apparatus after pressure has been formed therein. The small boiler or generator burns its own vapour to produce and maintain a constant supply, not only sufficient to heat itself, but to heat any number of furnaces according to its size and evaporating power. The quantity of vapour formed in the generator, and distributed to the furnaces to be heated by it, may be varied at will by the pressure that is maintained in the said generator and the quantity of mineral oil which is passed through it by means of the force-pump or injector employed to feed it.

3. The creating, maintaining, or augmenting the said pressure by means of water admitted into the boiler in very small quantities, or in other cases by a small quantity of steam, which is allowed to enter the conduit pipes, and mix with and be superheated by the heat of the vapour in its passage through the pipes between the generator and the furnaces where it is burned.

182.—AUGUSTE BOCHKOLTZ, of the city of Vienna, in the empire of Austria, civil engineer, Inspector-General of Railways, for "*An improved mechanical arrangement to be employed in connexion with self-acting valves.*" Patent dated Jan. 18, 1868.

This specification is not intelligible apart from the drawings attached thereto.

237.—WILLIAM ORAM, of Salford, in the co. of Lancaster, hydraulic engineer, for "*Improvements in apparatus to be employed for heating buildings, and for other heating purposes.*" Patent dated Jan. 23, 1868.

These improvements consist in taking or receiving the steam from the boiler or steam-generator into the first length of pipe, and continuing such piping to any required length throughout the building, and returning the steam to the boiler by introducing the last length or other extremity into the boiler below the water-line. A tap or valve is applied at the entrance-pipe, to control the admission of steam, and another is provided at the termination or exit, near where the pipe enters the boiler, by which tap water is withdrawn from the

heating-pipes; and, by such combined means, the constant circulation of the steam is effected, and an increased heat obtained from the pipes.

238.—David Yoolow Stewart, of Glasgow, in the co. of Lanark, N.B., ironfounder, for "*Improvements in the manufacture of cast-iron pipes and similar articles.*" Patent dated Jan. 23, 1868.

In carrying this invention into effect the cores made and more or less dried apart are at once adjusted in the undried moulds, whilst the latter with the cores in them are placed in the stoves in the inclined or vertical positions in which they are to receive the melted metal, the metal being run into them in the stoves as soon as convenient after they are sufficiently dried.

239.—Henry Hodge, of Southport, in the co. of Lancaster, ironmonger, for "*Improvements in gas-stoves for heating purposes.*" Patent dated Jan. 23, 1868.

This invention relates, first, to means by which gas-stoves—that is to say, stoves in which carburetted hydrogen gas is burned—are or may be rendered suitable for heating and warming greenhouses, churches, halls, and other places where a high state of purity of air is required, and for heating purposes generally, both when water circulating in pipes and hot air passing through tubes or flues are or either of them is the agents or agent employed to convey and distribute the heat. For this purpose a gas-stove of any desired outline is used, the frame or body of which is so formed or made air-tight that communication between the interior of the stove and the air in the compartment or place where it is situated cannot take place; that is to say, practically no air nor any of the products of combustion passes nor pass from the interior of the stove into the air in the apartment or place. To the gas jets or rings, which may be of any desired kind, is supplied the atmospheric air necessary to support combustion, through a shaft or passage led from the outside of the building, or from any convenient apartment or place. The products of combustion and heated air are conveyed away through a flue or passage, perferably made of considerable length, and led around the place to be heated, so as to allow nearly the whole of the heat to be radiated.

Secondly, the invention relates to the construction of a gas-stove embodying the above first part of the invention, wherein water is used as the agent to convey and distribute the heat evolved during combustion of the gas used. Two pieces of metal of a cylindrical form are constructed, the one larger than the other, and they are secured together at their ends steam-tight, so that the space between the two thus formed serves as a boiler or water container. Pipes are connected into the said boiler at the top and bottom thereof, and led away therefrom to any desired place. Filling, cleaning, gauge, and other connexions are also made into the said boiler. Within the inner cylindrical or other piece are the gas-jets. The flue to convey away the products of combustion is coupled to the top of the stove.

247.—Strother Price, of Highbury, in the co. of Middlesex, for "*An improved mode of and means or apparatus for turning on and off the supply of gas to houses; also applicable to turning on and off the supply of other fluids.*" Provisional protection only obtained. Dated Jan. 23, 1868.

This invention consists in attaching a weighted lever to the tap, and in carrying a wire, cord, or chain from the lever over pulleys or otherwise to the hall or other convenient part of the house. One or more springs may be connected to the lever. When it is required to turn on the gas, a handle or appliance at the end of the wire or cord is pulled so as to raise the lever, and the handle is then secured so as to keep the lever raised. When it is required to turn off the gas, the handle or appliance is released, and the weighted lever falls to its normal position, being assisted in its movement by the spring or springs, and the tap is thus turned.

253.—Andrew Small, of Glasgow, in the co. of Lanark, N.B., for "*Improvements in apparatus for removing excrements.*" Provisional protection only obtained. Dated Jan. 24, 1868.

This invention is more particularly applicable in connexion with the water-closet system, and consists in arrangements for separating the solid matters in a but slightly diluted condition, and so as to render them much more valuable for agricultural purposes than the ordinarily very diluted products of that system.

254.—Edwin William De Rusett, of Lewisham, in the co. of Kent, engineer, and Richard Farrell Dale, of Shoe Lane, in the City of London, founder, for "*Improvements in water-closets.*" Patent Dated Jan. 24, 1868.

This invention requires to be illustrated with drawings for its complete specification.

257.—Thomas Lesslie Gregson Bell, of Plaistow, in the co. of Essex, for "*Improvements in preparing oxide of iron for purifying gas, and in treating the oxide of iron residues to obtain products therefrom.*" Patent dated Jan. 24, 1868.

This invention has for its object improvements in preparing oxide of iron for purifying gas, and in treating the oxide of iron residues to obtain products therefrom. Heretofore for purifying gas peroxide of iron, either precipitated or natural, has principally been employed. Precipitated oxide of iron purifies gas very readily and perfectly, but is very costly to prepare in a state of purity, and cannot be made to contain a high per centage of the iron by any of the ordinary modes of manufacture, such as precipitating iron from copperas by the addition of lime, owing to the presence of the large quantity of lime required and the necessity for adding sawdust or other porous material to enable the gas to permeate it freely. It is consequently found that although it acts very perfectly at first, it soon becomes so charged with sulphur as to be useless. Many natural oxides of iron contain a much higher per centage of peroxide than those manufactured as before mentioned, and therefore last very much longer before becoming spent, but they act very slowly and with difficulty until they have been in use some time. These difficulties are obviated by freshly precipitating a certain quantity of iron throughout the substance of a native or natural peroxide, and so get ready and perfect action at first combined with great lasting quality and lowered cost of production.

The mode in which it is preferred to carry out my invention is as follows:—The natural oxide of iron is first ground; the fineness to which it should be ground depends on the nature of the substance operated upon. Oxides of a porous nature do not require to be so finely ground as others. A quantity of this ground oxide is placed in a large shallow vessel or vat, and over it is poured a boiling saturated solution of green copperas or other salt of iron (or the salt of iron may be added in powder, or may have been ground with the oxide and afterwards wetted); when this is thoroughly mixed the equivalent proportion of quicklime (sufficient to precipitate or decompose the salt of iron) is added, either dry or in partial solution, or mixed with a small quantity of fine sawdust, or other porous material. This mixture, which then forms a pasty mass, is turned out of the vat and made into a heap, and when sufficiently dry is finely sifted, and is then ready for use. For some reasons it will in many cases be found more convenient to first add the quicklime to the oxide; it may either be added in powder or by grinding it with the oxide, and afterwards adding the salt of iron in solution, as before mentioned, the resulting compound in either case being the same.

The salt of iron which it is preferred to use is the photosulphate of iron called green copperas; but the protochloride or perchloride of iron may be used with equal advantage.

The natural oxide which it is preferred to operate upon is that known as bog ochre; but there are others, such as kidney ironstone, which may be used. It is found that those answer best in which the iron exists as hydrated peroxide of iron. Excellent results are obtained from using two parts of natural oxide with one part of copperas and the equivalent portion of quicklime, but the proportions are varied according to the nature of the oxide operated upon. By using a natural oxide containing a high per centage of pure peroxide of iron as a basis on which to precipitate the solution of iron produce, a material can be produced for purifying gas which combines the advantages of the natural oxide with those of pure precipitated oxide, and without the disadvantages of either.

The next part of the invention, which relates to the extraction of cyanogen compounds and ammonia from oxide of iron material that has been used for purifying gas (commonly called spent oxide), consists in first separating the sulphur from the oxide of iron material by means of bisulphide of carbon or other solvent of sulphur, and then subsequently treating the oxide of iron material to obtain therefrom the cyanogen compounds and ammonia, as herein described. For this purpose after that sulphur has been dissolved from oxide of iron material by bisulphide of carbon or other solvent, and after that the material has been freed from the bisulphide or solvent by distillation, as is now well understood, a quantity of the material is put into a large vat. The description of vat preferred is one having a false bottom, through which liquor may filter and be drawn off, and also a series of taps or plugs in one side, so that as the contents settle the supernatant liquor may be drawn off at different heights. Upon the material in this vat boiling water is run, and it is thoroughly stirred. It is founed of advantage to blow steam into it, or apply heat in any other way; and if the material operated upon is not already slightly acid a small quantity of sulphuric acid is added, which facilitates the solution of the ammonia salts, principally sulphocyanide, and the sulphocyanide of iron, should there be any present; this is then allowed to settle, and the clear solution drawn off as closely as possible by the different taps, the remainder of the solution draining through the bottom. This operation may be repeated if necessary, or a series of these vats may be connected in a manner well known to manufacturing chemists, so as to thoroughly wash out the soluble salts. This clear solution is run into a boiler or close vessel, in which it may be treated, and to it is added quicklime in excess, so that on the application of heat the ammonia distils over, and is condensed in an acid, or converted into a merchantable salt of ammonia by any of the ordinary modes in use well known to manufacturing chemists. When the ammonia is all driven off the remaining liquid is run into another vat or settler, and the clear solution drawn off which contains principally sulphocyanide of calcium; to this is added carbonate of potash or soda, which precipitates the calcium as carbonate of lime, leaving sulphocyanide of potash or soda in solution; which is filtered and then crystallized out. To the solid matter remaining in the vat (after treatment with hot water as above) an alkali is added, either potash, soda, or lime, in sufficient quantity to dissolve out the cyanide or ferrocyanide of iron; this alkaline solution is then drawn off, and the solid residue washed several times with water so as to extract the whole of the soluble matter. These washings are run over several vats in succession so as to get them as fully charged as possible. These liquors are allowed to settle perfectly, and then enough acid (sulphuric or hydrochloric) is added to show an acid reaction, and if necessary they are again allowed to settle, and to the clear solution is added solutions of protosulphate and perchloride of iron sufficient to precipitate the whole of the alkaline ferrocyanide as ferrocyanide of iron or Prussian blue; this is thoroughly washed with water, and then drained and dried upon a filter. This, if necessary for greater purity, may be redissolved as before, and again precipitated and so purified, or it may be converted into ferrocyanide of potassium by dissolving in potash, filtering, and then crystallizing out the ferrocyanide of potassium (prussiate of potash).

If lime is used to dissolve out the cyanides or ferrocyanides in the first instance, it is preferred to add carbonate of potash to the solution; this precipitates the lime as carbonate, and after filtering and allowing the solution to settle in a series of settlers or vats, it is run into a pan, where by the application of heat it is concentrated to such a strength that when run into a series of vessels called crystallizers the prussiate of potash crystallizes out.

APPLICATIONS FOR LETTERS PATENT.

2944.—JOHN WRIGHT, of Birmingham, in the co. of Warwick, gas stove and burner manufacturer, and WILLIAM HENRY WILLIAMS, also of Birmingham aforesaid, machinist, for "*Certain improvements in the manufacture of gas-burners.*" Sept. 25, 1868.

2953.—HENRY DAVEY, of 9, Victoria Chambers, in the city of Westminster, engineer, for "*Improvements in steam-engines, part of which is applicable to steam-pumps.*" (Complete specification.) Sept. 26, 1868.

2959.—PETER SPENCE, of Newton Heath, Manchester, in the co. of Lancaster, manufacturing chemist, for "*Improvements in the manufacture of copperas, applicable to the purification of illuminating gas and to other purposes.*" Sept. 26, 1868.

2972.—ROBERT DUNCAN, of Billericay, in the co. of Essex, gentleman, for "*Improvements in earth-closets and commodes.*" Sept. 28, 1868.

2976.—JAMES WADSWORTH, of Medlock Street, Hulme, in the city of Manchester, for "*Improved apparatus for economizing fuel and utilizing the heat produced in fireplaces or stoves for warming and ventilating, and for other purposes.*" Sept. 29, 1868.

2979.—JOHN HENRY IRWIN, of Chicago, in the co. of Cook and state of Illinois, U.S.A., for "*Illuminating apparatus.*" Sept. 29, 1868.

2980.—EDWARD THOMAS HUGHES, of the firm of Hughes and Son, 123, Chancery Lane, London, patent agents, for "*Improvements in gas-burners.*" A communication. Sept. 29, 1868.

2987.—EDWARD HORTON, of Birmingham, in the co. of Warwick, gas-chandelier maker, for "*Certain improvements in the manufacture of chandeliers and other gas-fittings, having especial reference to the pulley-wheels, rosettes and balance-weights, smoke-shades, Argand burners, and other similar parts used therein.*" Sept. 30, 1868.

2993.—JOHN LAMBERT, foreman to the Rose Lane Iron-Works, Norwich, in the co. of Norfolk, for "*Improvements in apparatus for raising water.*" Sept. 30, 1868.

3009.—JOHN FREDERICK GUSTAVE KROMSCHRŒDER, of Gloucester Street, Camden Town, in the co. of Middlesex, gas engineer, for "*Improvements in apparatus for generating an inflammable gas or vapour suitable to be burnt at gas-burners to yield light and heat.*" Oct. 1, 1868.

3043.—JOHN RICHARDSON WIGHAM, of Albany House, Monkstown, in the co. of Dublin, Ireland, for "*Improvements in illuminating light-houses and in apparatus employed for that purpose, which apparatus is also applicable to the manufacture of illuminating gas generally.*" Oct. 6, 1868.

3044.—GEORGE GRAVELEY, of Bow, in the co. of Middlesex, engineer, for "*Improvements in steam-pumps and other engines actuated by steam or other motive fluid, and in combining sea-water distilling apparatus with steam-pumping and steam-cooking apparatus.*" Oct. 6, 1868.

GRANTS OF PROVISIONAL PROTECTION.

2300.—CHARLES FORSTER WALDO, of 13, Bread Street, Cheapside, in the City of London, merchant, for "*A new method of and new apparatus for raising, moving, transferring, and discharging water or other fluids.*" A communication. July 22, 1868.

2585.—JULIUS NEUMANN, of 2, Bedford Street, Bedford Square, London, merchant, at present residing at 4, Sibour Street, Paris, in the empire of France, for "*Improvements in apparatus for generating and purifying coal lighting gas, the said apparatus being adapted to household or domestic use, the gasholder automatically regulated, and the surplus gas produced used as fuel.*" Aug. 19, 1868.

2632.—GEORGE SINEFI DRACOPULO, of Cardiff, in the co. of Glamorgan, for "*A new apparatus for raising or forcing water, applicable to ships, mines, and other purposes.*" Aug. 24, 1868.

2637.—CARL JOHANN REINHART JAHNS, of Liverpool, in the co. of Lancaster, for "*Improvements in apparatus for obtaining motive power, and for registering the quantity or quantities of steam, water, or other liquid gases or vapours, and for pumping purposes.*" Aug. 25, 1868.

2666.—JOHN YULE, of Glasgow, in the co. of Lanark, N.B., engineer, for "*Improvements in arrangements and apparatus for dealing with sewage.*" Aug. 28, 1868.

2699.—FREDERIC HUDSON, of 227, Blackfriars Road, in the co. of Surrey, manufacturer of gas-meters, for "*Improvements in dry gas or liquid meters.*" Sept. 1, 1868.

2700.—WILLIAM CARTWRIGHT HOLMES, of 56, Gracechurch Street, in the City of London, engineer, for "*Improvements in apparatus used in the manufacture of gas.*" A communication. Sept. 1, 1868.

2745.—WILLIAM TATLOCK, of Frankfort, Germany, civil engineer, and CHRISTOPHER NICOLAY ABELSETH, of Philadelphia, Pennsylvania, U.S.A., civil engineer, both now of 8, Southampton Buildings, Chancery Lane, in the co. of Middlesex, for "*Improvements in apparatus for manufacturing gas.*" A communication. Sept. 5, 1868.

2752.—GEORGE DAVIES, of 1, Serle Street, Lincoln's Inn, in the co. of Middlesex, and 87, St. Vincent Street, in the city of Glasgow, civil engineer and patent agent, for "*An improved meter for water or other incompressible fluid.*" A communication. Sept. 7, 1868.

2780.—ALFRED VINCENT NEWTON, of 66, Chancery Lane, in the co. of Middlesex, mechanical draughtsman, for "*An improvement in pumps.*" A communication. Sept. 9, 1868.

2808.—GEORGE BOWER, of St. Neots, in the co. of Huntingdon, gas and water work engineer, and WILLIAM HOLLINSHEAD, of the same place, engineer, for "*Improvements in gas-engines.*" Sept. 11, 1868.

2813.—FREDERICK WARNER, of Jewin Crescent, in the City of London, engineer, for "*Improvements in constructing bore-holes or wells, and in pumps to be used therewith, and for other purposes.*" Sept. 12, 1868.

2832.—ENOCH SARJEANT, of Birmingham, in the co. of Warwick, metal worker, for "*Improvements in the manufacture of gaseliers, gas-pendants, gas-brackets, gas-standards, and other gas-fittings.*" Sept. 15, 1868.

2834.—CHARLES DE BERGUE, of 10, Strand, in the city of Westminster, engineer, for "*Improvements in gas-cooking stoves.*" Sept. 15, 1868.

2863.—WILLIAM EDWARD NEWTON, of 66, Chancery Lane, in the co. of Middlesex, civil engineer, for "*Improvements in apparatus for raising water and other fluids.*" A communication. Sept. 17, 1868.

2838.—WILLIAM HENRY HUGHAN, of Newton Stewart, N.B., postmaster and guano and seed merchant, for "*Improvements in the treatment of night-soil, sewage, and other like refuse matters, for the purpose of deodorizing and converting the same into manure.*" Sept. 19, 1868.

2931.—CHARLES HENGST, of Fulham Road, in the parish of Chelsea, in the co. of Middlesex, engineer, HENRY WATSON, of the same place, gas-fitter, JOHN BELL MUSCHAMP, of 68, Upper Thames Street, in the City of London, paper manufacturer, and NEWTON WILSON, of 144, High Holborn, in the co. of Middlesex, sewing-machine manufacturer, for "*Improvements in the manufacture of carburetted hydrogen or luminous gas.*" Sept. 24, 1868.

2933.—EPHRAIM DEATH and JOHN ELLWOOD, both of Leicester, engineers and co-partners, for "*Improvements in pumping apparatus.*" Sept. 24, 1868.

2935.—DAVID COWAN, of 115, Long Acre, in the co. of Middlesex, for "*Improvements in float-valves for the admission of hot and cold water and other fluids into and out of cisterns.*" Sept. 24, 1868.

2987.—EDWARD HORTON, of Birmingham, in the co. of Warwick, gas-chandelier maker, for "*Certain improvements in the manufacture of chandeliers and other gas-fittings, having especial reference to the pulley-wheels, rosettes and balance-weights, smoke-shades, Argand burners, and other similar parts used therein.*" Sept. 30, 1868.

2993.—JOHN LAMBERT, foreman to the Rose Lane Iron-Works, Norwich, in the co. of Norfolk, for "*Improvements in apparatus for raising water.*" Sept. 30, 1868.

INVENTION PROTECTED FOR SIX MONTHS BY THE DEPOSIT OF A COMPLETE SPECIFICATION.

2953.—HENRY DAVEY, of 9, Victoria Chambers, in the city of Westminster, engineer, for "*Improvements in steam-engines, part of which is applicable to steam-pumps.*" Sept. 26, 1868.

NOTICES TO PROCEED.

1657.—WILLIAM ENGLAND, of the city of Bristol, commercial traveller, for "*Improved apparatus for measuring liquids.*" May 20, 1868.

1668.—EDMÉ AUGUSTIN CHAMEROY, of 162, Rue Faubourg St. Martin, Paris, manufacturer, for "*An improved liquid or gas meter.*" May 21, 1868.

1675.—THOMAS GOODE MESSENGER, of the Midland Steam-Works, Loughborough, in the co. of Leicester, hydraulic engineer and valve manufacturer, for "*Improvements in fire-engines or double-action pumps.*" May 21, 1868.

1699.—EDWIN WILLIAM DE RUSETT, of Lewisham, in the co. of Kent, civil engineer, for "*Improvements in engines worked by steam or other motive fluid, specially applicable to steam-pumps.*" May 23, 1868.

1738.—WILLIAM BARRY LORD, of Stamford Lodge, Hampstead Heath, in the co. of Middlesex, gentleman, for "*Improvements in portable filters.*" May 26, 1868.

1751.—JOHN SCHOLL, of Berwick Street, Soho, in the co. of Middlesex, engineer, for "*Improvements in gas-burners and in apparatus to be used in connexion therewith.*" May 27, 1868.

1754.—RICHARD FELL, of Robinson's Row, in the co. of Middlesex, engineer, and ROBERT BARLOW, of Shacklewell Lane, in the co. of Middlesex, builder, for "*Improvements in apparatus for preventing waste of water in or from water-closets and drinking fountains, cisterns, tanks, and other like receptacles.*" May 28, 1868.

1755.—WILLIAM DALZIEL, of Deptford, in the co. of Kent, brassfounder, for "*An improved combination of cock and valve for controlling the flow of water from constant-supply pipes.*" May 28, 1868.

1831.—CLINTON EDGCUMBE BROOMAN, of the firm of Robertson, Brooman, and Co., of 166, Fleet Street, in the City of London, patent agents, for "*Improvements in apparatus for the manufacture or production of carbonic oxide, hydrogen, and carbonated hydrogens.*" A communication. June 4, 1868.

PATENT WHICH HAS BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £100 BEFORE THE EXPIRATION OF THE SEVENTH YEAR.

2377.—JOSEPH JACOB, "*Improvements in the mode of and apparatus for obtaining and treating hydrogen gas, and the application thereof to various purposes, parts of which improvements are applicable to the manufacture of iron and steel.*" Sept. 23, 1861.

AVERAGE COMPOSITION AND QUALITY OF THE METROPOLITAN WATERS IN SEPTEMBER, 1868.—The following are the returns of the Metropolitan Association of Medical Officers of Health:—

NAMES OF WATER COMPANIES.	Total Solid Matter per Gallon.	Oxygen required by Organic Matter, &c.	Nitrogen.		Hardness.	
			As Nitrates, &c.	As Ammonia.	Before Boiling.	After Boiling.
Thames Water Comps.	Grs.	Grs.	Grs.	Grs.	Degs.	Degs.
Grand Junction	18·33	0·082	0·068	0·002	12·0	3·0
West Middlesex	18·16	0·068	0·057	0·002	12·0	3·0
Southwark and Vauxhall	21·83	0·136	0·093	0·005	14·0	3·5
Chelsea	18·98	0·072	0·060	0·002	13·0	3·5
Lambeth	18·90	0·086	0·075	0·004	13·0	3·5
Other Companies.						
Kent	27·81	0·022	0·321	0·000	18·5	7·5
New River	17·33	0·045	0·175	0·000	11·5	2·5
East London	16·20	0·043	0·082	0·002	11·0	2·5

Note.—The amount of oxygen required to oxidize the organic matter, nitrites, &c., is determined by a standard solution of permanganate of potash acting for three hours; and, in the case of the metropolitan waters, the quantity of organic matter is about eight times the amount of oxygen required by it.

All the samples were clear when drawn from the mains.

H. LETHEBY, M.B.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

CITY COURT OF SEWERS—GUILDHALL, TUESDAY, OCT. 6.

At the Meeting of the Commissioners, held this day—Deputy DE JERSEY in the chair,

Mr. PEDLER rose, pursuant to notice, to propose a resolution conveying to Dr. Letheby the thanks of the court for the services rendered by him as gas analyst to the City of London. He said that at their last meeting the commissioners received the resignation of Dr. Letheby, who had for many years filled that important office, and it appeared to him (Mr. Pedler) that the court would be glad of the opportunity of expressing its sense of the valuable and important services which Dr. Letheby had rendered to the public. It would be remembered that in 1851 the City was in a great state of excitement in reference to gas matters, and that in that year the Act of Parliament incorporating the Great Central Gas Company was passed. Under that Act it became imperative upon the commission to appoint a gas analyst, and Dr. Letheby was elected to the office in the following year. At the time of his appointment very little was known as to the conditions of the gas supply, and the only thing which seemed to be clearly understood by the citizens was that the newly established company promised to provide it at a lower rate than it had theretofore been charged. The question of the best mode of testing gas was at that time in a state of uncertainty, and there was comparatively no security to the public respecting the quality of the gas. Dr. Letheby, after his appointment, devoted a large amount of attention to the subject, the effect of which was the introduction of the admirable mode of testing now in use. One important point to which Dr. Letheby very early directed his attention was the use of a better standard candle than wax; for as a wax candle was always made with a common wick, and not with a plaited wick (wax candles are still made by rolling them, and therefore a plaited wick could not be used), it was necessary to snuff it in the same way as a common tallow candle; and the difficulty was to know when it should be snuffed—a snuffed candle giving so much better light than one with a rather long wick. It was, therefore, manifestly of great importance that in testing the illuminating power of the gas a candle should be used which would not require snuffing; and accordingly, after making more than a thousand experiments as to the comparative light of sperm and wax, Dr. Letheby ascertained that the power of wax was just one-seventh less than that of sperm—he found, indeed, that it took 16 wax candles to give the light of 14 sperm. And so at the end of the year 1852 he reported to the commission that for the future he would use a sperm candle for the standard in the experimental tests, and would reduce it to its value in wax, according to the above results—the standard in the Great Central Company's Act being that 5 feet of gas burnt from an Argand burner of 15 holes, and a 7-inch chimney, should be equal to 12 wax candles, each burning at the rate of 120 grains per hour. His next improvement was still further to increase the certainty of the light from the standard candle; for as a single candle might at any moment be burning above or below its average proportion, and as moreover the light of a single candle, as measured against the strong glare of the gas, was always difficult to estimate, he adopted the contrivance of using two sperm candles for the experimental standard, and from that time the results had been more conclusive. From the beginning of his appointment also Dr. Letheby perceived the importance of ascertaining, by means of some simple and easily applied process, the amount of sulphur contained in coal gas in other forms than that of sulphuretted hydrogen, and after much laborious research, with a great variety of contrivances, he was able, in 1853, to recommend a process which was now universally employed in gas testing, and was described in modern Acts of Parliament as "Letheby's sulphur test." But besides this, he made numerous experiments with all kinds of illuminating agents, such as sperm and colza oils, camphines, naphthas, stearic acid, &c.; and with a large number of gas-burners, as bat's-wings, fish-tails, cock-spurs, Leslies, Argands, &c., the results of which were embodied in his earlier reports to the commission. For the purpose of ascertaining the effect of distance on the quantity of the gas supplied to the public, Dr. Letheby instituted a series of experiments on the same gas (the Great Central) at various points in its course along the mains—as, for instance, at the Great Central Company's works, at the laboratory of the London Hospital, and in the City. The results of these investigations had not merely cleared away the confusion on the subject, and given certainty to a branch of technical science that was previously obscure, but they had been recognized by Parliament, and had been made the basis of all legislation in respect of the supply of gas to the public. They constituted the leading provisions of the Metropolis Gas Act of 1860, and of the City of London Gas Act of 1868; and but for these facts there could have been no certain legislation, for nowhere in all England had there been such a systematic examination of the subject as had been made by the City analyst. After the passing of the Metropolis Gas Act of 1860, when the Commissioners of Sewers were empowered to examine the quality of the Chartered and City Companies gas, as well as that of the Great Central, Dr. Letheby was reappointed the gas analyst for the City; and thus for nearly seventeen years there had been a continuous and uninterrupted series of examinations of the gas supplied to the consumers within this City by the same officer and with the same instruments, and hence the most reliable data had been obtained for a comparison of the quality of the gas supplied to the public at any future time. Contemporaneously with improvements in the methods of examining gas for public purposes, there had been developed in the City laboratory numerous practical facts of the greatest interest in the science of gas lighting, as, for example, the means of reducing the amount of sulphur in the gas by improved methods of purification; the removal of naphthaline from the gas, so as to prevent those constant obstructions to the flow of it in the mains and services; the determinations of the conditions under which the processes of carburation of gas could be economically applied; and, lastly, the important question concerning the construction of burners and the pressure at which the gas should be consumed at them, so as to secure the maximum amount of light, had been satisfactorily determined. It might therefore be said that, during the seventeen years which had elapsed since the appointment of a gas analyst was made, the City had aided, through its officer, in changing and improving the whole aspect of the gas question; as, 1st, by perfecting the means whereby the illuminating power of the gas is ascertained; 2nd, securing a more satisfactory standard of illuminating power than a wax candle; 3rd, contriving a method for estimating the amount of sulphur in coal gas; 4th, pointing to the means whereby the quantity of sulphur might be reduced to the smallest proportion; 5th, ascertaining the conditions and the best form of burner whereby gas could be most economically consumed; 6th, determining the practical value of the several processes of carburation; and, lastly, furnishing the public with reliable information as to the quantity of the gas supplied to them, and thus securing a basis for improved legislation, not merely as regarded the supply of gas to the City of London, but to most of the large towns of England. For a long time previous to Dr. Letheby's appointment the quality of the gas supplied generally was very unsatisfactory on account of its impurity, and it was almost a question whether the disadvantages connected with it did not counterbalance the benefits which were derived from that mode of lighting: while the discharge of the refuse from the gas-works into the river constituted a very serious nuisance, and was a constant source of complaint. In the progress of science, however, it had been discovered that the products arising from the manufacture of gas were of a most valuable kind, and their utilization had resulted in the abatement of a nuisance, and the prevention of the injury to furniture, books, &c., which formerly existed wherever gas was consumed. Dr. Letheby had materially assisted in the accomplishment of these important ends, and the commission had reason to congratulate themselves that their appointment had conduced so largely to bring about these results. Under these circumstances, and seeing that Dr. Letheby's connexion with the commission in his capacity of gas analyst was about to cease, he (Mr. Pedler) thought it would be a graceful act on their part to adopt some resolution expressive of their high opinion of his merits, and of the advantages which had been secured to the citizens by his laborious research and unintermitted labours. Without, therefore, trespassing further on the time of the court, he would venture to propose the following:—"Resolved, that on the resignation of Henry Letheby, Esq., as gas analyst for the City of London, this court desires to record its sense of the very valuable services rendered by him during a period of seventeen years in that capacity, and congratulates him on having been selected by the Government to fill the important office of chief gas examiner under the City of London Gas Act, 1868."

Mr. BONTEMS said he had great pleasure in seconding the motion, and he did so the more readily because a year or two previously, in the Court of Common Council, he felt it his duty to complain of a little discrepancy between one part of Dr. Letheby's evidence and another when before a committee of the House of Commons. Notwithstanding that little discrepancy, which he could not account for then, and could not account for now, he believed Dr. Letheby had been a most efficient and valuable officer of the commission, and that he had been of considerable service in obtaining the new Act of Parliament under which gas would be supplied to the City in future. He was sorry the commission had lost the services of Dr. Letheby as gas analyst, but seeing they had lost him, it was very gratifying to know that it was in consequence of his having received the appointment of chief gas examiner under the Board of Trade—an office in the discharge of the duties of which his strict impartiality might be relied on. He (Mr. Bontems) felt that it was not necessary for him to go into the scientific part of the subject, which had been so fully gone into by his friend, Mr. Pedler; he would only say that, having the fullest confidence in the ability and integrity of Dr. Letheby, he believed the Board of Trade could not have made a better and more satisfactory appointment. With this conviction, he very cheerfully seconded the motion.

The resolution was put, and carried unanimously.

Mr. BONTEMS said, before the gas question was disposed of, he should like to say a word or two upon a point which it was very important should be publicly known, and that was with regard to the appointment of gas referees by the Board of Trade. He thought every member of the commission must have been surprised to find that the engineer of one of the gas companies supplying the City of London had been appointed the principal referee under the City of London Gas Act of last session. He called this gentleman, Mr. Evans, the principal referee, because, being a scientific man, he was the most important person of the three. The City of London Gas Act defined the duties of the referees to be as follows:—"The referees shall, subject to the provisions of this Act, from time to time prescribe and certify the mode to be adopted for testing and recording the illuminating power of gas supplied by the companies, and the number of the times of testing." Then again, they were from time to time to "inspect the works of the companies, and investigate the processes of manufacture carried on therein, with the view of ascertaining the means adopted therein for purifying gas and for preventing nuisance, and from time to time to apply all such tests as they think expedient at the works of the companies or elsewhere for ascertaining the amount of sulphur and ammonia, and of compounds thereof, or other impurity with which gas supplied by them is charged." Further, they were "from time to time to ascertain with what degree of purity each company can reasonably be required to make and supply gas continuously without occasioning a nuisance to the neighbourhood in which the works are situate, and prescribe and certify the maximum amount of impurity in each form with which the gas supplied by the company shall be allowed to be charged;" also to "prescribe and certify the mode to be adopted for testing and recording the purity of gas supplied by the companies, and the number of times of testing." They were also to prescribe and certify the testing-places and apparatus, and—a matter which more nearly affected the commissioners who had charge of the public lamps of the City—"the gas for public lighting shall, if required by either party, be supplied by measurement, and the gas referees shall, if required by either party, from time to time prescribe and certify the mode of ascertaining the quantity of gas consumed by the public lamps." When it was thus seen how important were the duties of the referees, and when it was remembered that from their decision there was no appeal, it certainly did seem to be a monstrous thing that the engineer of one of the companies actually supplying gas in the City should be selected to be one of the referees, and, as he had said, the chief of the three. The corporation Gas Committee, of which he (Mr. Bontems) was the chairman, had addressed a communication to the Board of Trade, asking whether Mr. Evans, in accepting their appointment, had resigned his office as engineer to the Chartered Gas Company, and urging upon the board that it was most essential the public should have confidence in the persons appointed to carry out the provisions of the Act of Parliament. An answer had been received to their communication, stating that the board were not aware of any intention on the part of Mr. Evans to resign his connexion with the Chartered Company, and that they saw nothing anomalous in that position with the duties he would be called on to perform under the Act, and thought there was no reason why the public should not have confidence in the appointment. Now, he (Mr. Bontems) knew it to be a fact that the other gas companies were surprised at the appointment, and, indeed, he had not spoken to any gentleman connected with gas-works, whether as director or officer, who did not regard the appointment as decidedly wrong. He thought it right that the public should know the facts in reference to this matter, and that public opinion should be brought to bear against it. He had nothing to say against Mr. Evans; no doubt he was a most honourable and able man; the only thing to be wondered at

was that he himself did not see how incompatible the two offices were. Amongst other things it might be mentioned that Mr. Evans was one of the witnesses who gave evidence before the committee of the House of Commons with regard to the price at which gas could be supplied, and distinctly expressed it as his opinion that 16-candle gas could not be sold by the Chartered Company at less than 4s. 6d. per 1000 cubic feet. He had now been appointed by the Board of Trade to carry out an Act of Parliament which provided that the company, of which he was the engineer, should supply 16-candle gas at 3s. 9d. per 1000 cubic feet. It did seem monstrous, therefore, that such an appointment should ever have been made; and though he (Mr. Bontems) did not ask the court to come to any resolution upon the subject at the present moment, he thought it right that they, as representing the consumers of gas in the City, should know what had taken place; and he believed before long they would have to express a decided opinion upon it.

Mr. CHAPLIN then moved that the vote of thanks passed to Dr. Letheby be emblazoned on vellum, signed by the clerk to the commissioners, and framed and glazed for presentation, at an expense not exceeding £20.

Mr. WHITESIDE seconded the resolution.

Deputy WHITE inquired what steps the committee of the corporation intended to take with regard to the appointment of Mr. Evans. It seemed to him to be a very important matter, and one deserving serious consideration.

Mr. BONTEMS said the committee would, no doubt, submit a report to the Common Council, embodying their opinion, at an early period. As regarded any proceedings by the commission, he would rather they were initiated by some one else than himself.

Deputy BURNELL hoped the committee would adopt the suggestion made by Mr. Bontems, and would also at the same time inquire whether any other officer of the corporation had given evidence adverse to the interests of the citizens of London.

Mr. BONTEMS reminded the worthy deputy that Mr. Evans was an officer, not of the corporation, but of one of the gas companies. He might state that up to that time the corporation had received three days reports of the gas examiner under the provisions of the City of London Gas Act, from which it appeared that on two of those days the gas of the Great Central Company had been below the 14-candle standard to which the citizens were entitled; this was a matter which would also be reported to the court.

After some conversation on a point of order as to whether the resolution before the court could be submitted without notice of motion,

Mr. COX, in supporting the resolution, expressed a desire to add his testimony to that of previous speakers to the value of Dr. Letheby's services. He thought no one could have paid much attention to the proceedings of committees of the House of Commons on the gas question during the last few years without being struck with the marked effect always produced by Dr. Letheby's evidence. The ability and laborious research which Dr. Letheby had brought to bear on the conditions of the gas supply were of incalculable benefit to the health of the public, as well as to their advantage in a pecuniary sense. Dr. Letheby's services had reflected credit upon the commission to which he had been attached, while the splendid series of observations which he had continued for years had resulted in the establishment of principles which had become the basis of general legislation on the subject.

The CHAIRMAN ruled that the motion was perfectly in order, and thought that the proposed mode of presenting the vote of thanks was one that would be creditable to the commission and gratifying to Dr. Letheby.

The motion was unanimously and cordially adopted.

Deputy WHITE suggested that the question of the appointment of Mr. Evans as one of the referees should be sent to a committee for consideration and report.

The CHAIRMAN doubted whether the court could properly interfere in the matter. The Act of Parliament vested the control entirely in the corporation.

Mr. BONTEMS reminded the chairman that there had been a question between the companies and the commission as to the measurement of gas supplied to the public lamps. The companies had insisted that, if the meter system were adopted, a meter should be fixed to each lamp. Mr. Evans was the engineer of one of the companies which had refused the offer of average meter indication, and so far, at least, the commission, as representing the public, had a right to remonstrate.

The CHAIRMAN acquiesced in this view of the case.

Deputy WHITE then moved, and Mr. HORA seconded, that a representation be made to the Government on the appointment of Mr. Evans, and that it be referred to the Streets Committee to carry out the same.

The motion was put, and agreed to.

The CLERK said he had received the following letter from the City Gas Company:—

Sir,—I am instructed by the directors to state that as the City of London Gas Act, 1868, came into operation on the 1st inst., they assume their liability on account of the testing-room in Jewry Street ceases from that date, and they have given directions that the supply of gas to that building from this company's mains be forthwith discontinued. (Signed) B. J. MILLAR, Sec.

Mr. BONTEMS said he thought the answer to that letter ought to be that, at the request of the gas referees, the corporation had consented that for the present the test should be at the old testing-place. The letter just read must have been written in ignorance of this fact.

An answer to that effect was ordered to be sent to the City Gas Company.

COURT OF COMMON COUNCIL—THURSDAY, OCT. 1.

At the Meeting of the Court this day—Sir BENJAMIN PHILLIPS presiding, in the absence of the Lord Mayor—the following letter, which had been addressed to the Remembrancer, was read:—

5, *Westminster Chambers, Victoria Street, London, Sept.* 25, 1868.

Sir,—The gas referees appointed under the powers of the City of London Gas Act, 1868, are engaged in carrying out the requirements of the 40th section of that Act, which imposes upon the companies the obligation of providing testing-places, and the necessary apparatus for testing the illuminating power and purity of the gas supplied by them respectively; but before completing their arrangements the gas referees will be glad to receive the views of the corporation of London on the subject of locality.

I am directed to ask you to be so good as to learn from the corporation if they would sanction the use of the present testing-place until the gas referees are in a position to certify testing-places under the said Act.

(Signed) W. H. RICKARDS, Secretary, *pro tem.*

To the City Remembrancer, Guildhall, E.C.

Mr. BONTEMS said that, with regard to the latter portion of the letter, it had been agreed to allow the present testing-places to be used until the new ones were provided; and in respect to the former, he would move that it be referred to the Special Gas Committee to consider, and report thereon.

The motion was agreed to.

COMMERCIAL GAS COMPANY.

The Ordinary Half-Yearly Meeting of this Company was held at the London Tavern, Bishopsgate Street, on Friday, Oct. 2—JAMES HOLBERT WILSON, Esq, the deputy-chairman, presiding.

Mr. WILSON, on taking the chair, said: Gentlemen, I have received a letter from our chairman, Mr. Charles Salisbury Butler, and I am sorry to say he is confined to the house by a severe attack of rheumatism. He deeply regrets, as I need hardly say I do, that he cannot be present to-day, but with your assistance I will endeavour to conduct the business to the satisfaction of the meeting.

The SECRETARY (Mr. Jaques) having read the advertisement convening the meeting, the corporate seal was affixed to the register of proprietors, and the minutes of the last meeting were read and approved.

The following report and statement of accounts were presented:—

The directors report that, during the half year ending the 30th of June last, a net profit has been realized amounting to £22,094 6s. 4d., and they recommend that a dividend of £5 per cent. for the half year (less income-tax) be declared.

The bill introduced into the House of Commons in the past session, to amend the Metropolis Gas Act, 1860, to which reference was made in the preceding report, was withdrawn. Another bill, promoted by the corporation of the City of London, for powers to construct works and manufacture gas in opposition to the companies supplying gas in the City, was altered into a bill entitled "The City of London Gas Act," for regulating the supply of gas within the City, and received the Royal Assent.

STATEMENT OF ACCOUNTS,

Showing the Actual State and Condition of the Concerns of the Commercial Gas Company, for the Six Months, ending the 30th day of June, 1868.

I. CAPITAL.—*State of the Account at the End of the above Six Months.*

Statute, or Authority, under which raised.	Number of Shares.	Amount per Share.	Paid up per Share.	Total Paid up.	Total Capital.
Shares	17,486-2/5ths-1/10th-1/20th 3-4/5ths-1/10th	£25 0 0	£25 0 0 Various.	£437,163 15 0 66 10 0	
COMMERCIAL GAS ACT, 15 & 16 VICTORIA, cap. 155.	17,490-2/5ths 1/20th				£437,230 5 0

II. REVENUE.—*Account during the above Six Months.*

RECEIPT.			EXPENDITURE.		
Sale of gas—			Management—		
At 4s. per 1000 feet	£57,319 5 3		Directors allowances	£750 0 0	
Public lighting and contracts	7,529 16 7		Salaries of secretary and clerks	1,408 9 10	
		64,849 1 10	Collectors commission and pay	847 11 4	
Sale of residual products—			Rent, rates, and taxes of offices	50 0 0	
Coke	£9,953 7 3		Stationery, printing, and general charges	764 11 11	
Breeze	272 9 4		Payment to auditors	75 0 0	
Tar	1,671 4 4				£3,895 13 1
Ammoniacal liquid	571 5 0		Manufacture of gas—		
		12,468 5 11	Coals, including carriage, dues, &c.	£34,095 1 3	
Miscellaneous receipts		229 16 8	Purifying materials	726 12 8	
			Supervision and labour	10,509 16 6	
			Tools and other implements	240 14 0	
			Ordinary repair and maintenance of premises	2,077 9 1	
			Rents, rates, and taxes of manufactory	1,784 5 11	
					49,433 19 5
			Distribution, including service-mains, pipes, &c.—		
			Ordinary repair and maintenance		1,071 17 6
			Meters—		
			Restoring and replacing		1,051 8 1
			Balance for shareholders profit		22,094 6 4
	£77,547 4 5				£77,547 4 5

Reserve-fund invested in Consols, £11,443 7s. 7d.

We have examined the above accounts, and certify them to be correct.

CHARLES SALISBURY BUTLER, *Chairman.*
GEORGE JAQUES, *Secretary.*

The CHAIRMAN: Gentlemen, as our report is a short one, I will, with your permission, proceed to supplement it with a few observations. I am very happy to say that our works at Stepney, the machinery, and everything connected with them are in good order, and quite sufficient in capacity for the supply of as large a demand for gas as can be made upon us during the ensuing winter. During the last half year, as you are all aware, there has been great distress in our district. Many of the manufactories at the eastern end of London have been closed, and I am sorry to say the distress still prevails. Still, by careful working and economical management, we have earned a sufficient profit to enable us to offer you to-day as good a dividend as we did on the last occasion, and, as I rejoice to think, we have been able to pay for many years past, without resorting at all to our reserve-fund. I am glad also to say that while doing so we have maintained the high illuminating power of our gas, which, according to the independent testimony of persons employed by the district boards to test it, is of exceedingly good quality. But, gentlemen, while we have had comparatively little anxiety at Stepney, we have had a considerable share of it at Westminster. During the early part of this year—and it has been of annual recurrence for some time past—we have been obliged to attend the committee-room of the House of Commons, and to expend large sums of money out of our revenue to protect the interests of the company. We have been engaged in a parliamentary contest with parties who allege no malfeasance against the company, who do not state that we have violated in any single instance the provisions of the Act of 1860, but who seem to be influenced solely by a desire to obtain gas at a price which all the evidence produced proves cannot at the present moment be supplied. If, instead of putting us to this heavy expense, they would allow us for a few years a little rest, I have no doubt we should be able to give all those advantages to the public which they are so anxious prematurely to obtain. I think you will permit me for one moment, in proof of this assertion—as words are words and deeds are deeds—to refer to the Act of 1860. By that Act the maximum price of gas was fixed at 4s. 6d. per 1000 cubic feet, but the Commercial and other metropolitan companies have, without pressure, reduced their price to 4s. The illuminating power of gas prescribed by that Act was 12 candles, but we have voluntarily maintained our gas at over 14 candles; by that Act a rental was to be charged for meters supplied by the companies to the public, but we have from the very commencement gratuitously furnished meters to our consumers. These are facts, gentlemen, and facts are stubborn things. During the last session, as you are aware, gas legislation was confined to the City of London. Under pressure the City companies were obliged to accept an Act which in 1870 will compel them to supply gas at 3s. 9d. per 1000 cubic feet of an illuminating power of 16 candles. I say "obliged," because all the evidence went to show that at the present time, and probably for some years to come, it will not be possible for them to maintain their statutable dividends and supply the public on those terms with gas of that high illuminating power—that is, with more expensive gas than they now manufacture. However, such is the Act of Parliament. We, the metropolitan companies outside the City, are not included in it, and I think you will see that while this Act is avowedly an experimental Act—for there are certain provisions in it for a revisal of these terms in 1871, in the event of the companies not obtaining their dividends—we and the other companies outside the City are not likely to be included. Good sense, I think, would dictate that this Act should be fairly tried and found to answer before the same measure is applied to the other companies in the metropolis. Gentlemen, I do not know that I have any other observations to make to you. I trust, from the confidence you place in us, you will see that we are attending to your interests, not only at Stepney, but everywhere else, and that whilst it is our earnest desire to do all we can for the public, we are determined to protect those interests which you have entrusted to our care. I will merely add that I shall be pleased to hear any observations the proprietors may make, and, as far as lies in my power, to answer any questions which may be proposed to me. I move—"That the report and accounts be received, adopted, and entered on the minutes."

Mr. RHODES seconded the motion, and, referring to the item in revenue account—"Public lighting and contracts"—inquired whether the private lighting contracts were nearly brought to a close.

The CHAIRMAN: There are none; they are all brought to a close. The word "contracts" in the accounts refers to the public lighting contracts.

Mr. RHODES inquired further why "Rent, rates, and taxes," were charged in two places in the account.

The CHAIRMAN explained that, according to the form of account prescribed by the Home Office, the "Management" expenses were kept distinct from the expenses relating to "Manufacture," and that the amount charged under the two heads for "Rent, rates, and taxes," was the total sum paid by the company.

Mr. RHODES asked whether any information could be given as to the amount of leakage.

The CHAIRMAN replied that during the past half year it had been about 13 per cent. That included unaccounted-for gas from all sources.

Mr. RHODES inquired of the engineer whether all the mains of the British Company had been taken up.

Mr. JONES said the British Company's mains had been either replaced by mains of a larger diameter, or the gas formerly sent through them had been turned into the system of the Commercial Company's mains.

Mr. RHODES said he thought, after the remarks made by the chairman as to the expenses of parliamentary contests, the proprietors might congratulate themselves that the company had no item under that head in the present half year's accounts.

The CHAIRMAN said, although there was no such charge in those accounts, he must in fairness tell the meeting that there would be an item of the kind next time. At present the directors were not aware of the exact amount expended, and they hoped it would not be very large.

Mr. LONDON said the reserve-fund now amounted to £11,443. He was glad to know that such a fund existed, and he desired to learn from the chairman whether there was any limit to the amount which might be placed to its credit. He further asked to what purpose the interest received on Consols, in which this fund was invested, was applied, there being no statement relating to it in the accounts.

The CHAIRMAN, in reply to the first question, said the reserve-fund was limited to 10 per cent. on the capital of the company, so that the total amount when the fund was completed would be £43,000. In reply to the second question, he stated that the interest on the money invested was carried to the fund itself every half year.

Mr. LONDON said his object in inquiring was to ascertain that the present shareholders, who had all the liabilities of the company, were not deprived of the advantages to which they were entitled by the formation of an unlimited reserve-fund for the benefit of future shareholders.

The CHAIRMAN reminded the honourable proprietor that the dividends payable to the shareholders were limited to 10 per cent., beyond which the company were entitled out of profits to create a reserve-fund to the extent of 10 per cent. on the paid-up capital. When these two objects were attained, all the profits arising from the successful operations of the company belonged to the public, and must be given to them in the shape of a reduction in the price of gas. It must not, however, be forgotten that the Commercial Company had voluntarily reduced the price of their gas from 4s. 6d. to 4s. before they had one-fourth of their reserve-fund in hand. The object of the reserve-fund was to maintain the uniformity of the dividend in the event of a falling off in the profits of any half year.

Mr. SAMUEL inquired how it happened that "Rent" was charged in the accounts, inasmuch as the works of the company were erected on their own freehold.

The CHAIRMAN said it was true that the company had no rent to pay, but the accounts were, as he had previously remarked, made up in the form prescribed by the Government.

The motion for the adoption of the report was then put, and carried unanimously.

The CHAIRMAN moved—"That, pursuant to the recommendation of the board of directors, a dividend of 5 per cent. for the half year ending the 30th of June last, less income-tax, be now declared, and that cheques be forwarded to the shareholders on Monday, the 5th inst."

Mr. RHODES seconded the motion, which was put and carried.

On the motion of Mr. SAMUEL, a cordial vote of thanks was given to the directors for their assiduous attention to the interests of the company.

The CHAIRMAN acknowledged the vote, and again expressed his regret at the absence of Mr. Butler, whose regard for the welfare of the company had been displayed for many years past.

A vote of thanks was given to the auditors for their services, and Mr. WEBB acknowledged the obligations of his colleagues and himself for this mark of the approval and confidence of the proprietors.

A vote of thanks was also presented to the secretary, engineer, and the other officers of the company.

The SECRETARY acknowledged the vote, and said that the officers of the company were at all times ready and willing to devote their best energies to promote the prosperity of the company.

The proceedings then terminated.

CHARTERED GASLIGHT AND COKE COMPANY.

The Half-Yearly Meeting of the Shareholders in this Company was held, pursuant to "The Gaslight and Coke Company's Act, 1868," at the Chief Office, Horseferry Road, Westminster, on Friday, the 2nd inst.—S. A. BECK, Esq., the governor, in the chair.

The SECRETARY (Mr. J. O. Phillips) having read the advertisement convening the meeting, the seal of the company was affixed to the register of proprietors. The minutes of the last half-yearly meeting and subsequent extraordinary general meetings were then read and confirmed.

The directors report and the accounts, having been circulated previous to the meeting, were taken as read. The following is a copy:—

The directors beg to refer the shareholders to their half-yearly statement published in the month of April last, in continuation of which they have now the pleasure to report the result of the recently concluded parliamentary session, as follows:—

The committee of the House of Commons (which, as previously announced, was appointed to meet on the 23rd of May last) was presided over by the Right Hon. Edward Cardwell, and having, at the outset of their proceedings, determined that "they would not, without the consent of the metropolitan gas companies, recommend the adoption of a general bill compelling the companies to supply the consumer on other terms than those on which they had been authorized by Parliament to raise, and had actually raised, the capital which they employ;" and the consent of the whole of the companies except those which light the City of London having been withheld, the general bill which had been introduced by Mr. Morrison for the amendment of the Metropolis Gas Act, 1860, as applicable to the whole of London, was, with the concurrence of this company, the City Company, and the Great Central Company, limited in its operation to the districts of those three companies, and, after considerable modification of its provisions, it has received the Royal Assent, under the title of "The City of London Gas Act, 1868."

The extra burthens which have been cast by the Act on the three companies are no doubt onerous; they are, however, no greater than those to which last year the whole of the thirteen companies purposed submission. The right to the parliamentary maximum dividend is, moreover, distinctly recognized; and, with a view to its maintenance, a power of revision of the quality and price of gas in favour of the companies is provided. These important rights being secured, the directors have felt that the additional limitations and restrictions, costly and severe though they be, and the supervision by Government officials of manufacture and accounts, which the Act enforces, are safeguards to the public, from the imposition of which no company ought to shrink, and from which this, the oldest gas company in the world, has nothing to fear.

The acquiescence in the provisions of the Act by the three above-named companies was followed by the passing, almost without alteration, of this company's special bill, under the title of "The Gaslight and Coke Company's Act, 1868," for the erection of new works near Barking; and it is a noticeable fact that, although the new capital obtained of late years by other gas companies has been restricted by Parliament to a dividend of about 7½ per cent., the large amount of additional capital authorized by this company's Act is not subject to any such limitation, and the whole of its share capital, new as well as old, is entitled to the 10 per cent. dividend permitted by the Gas-Works Clauses Act, 1847. Up to the present time, the company has had no power of raising money by borrowing; and another important advantage which Parliament has now conceded to the company is the power to raise immediately on loan the sum of £300,000 in respect of the existing share capital, prior to the issue of any new shares, and the directors have the great pleasure to state that the whole of this amount having been already, and without the slightest difficulty, raised at a moderate rate of interest, they are now proceeding to carry their Act into effect.

The consequence of the passing of the company's bill was, that the bill for new works promoted by the corporation of London was withdrawn.

It is the painful duty of the directors to place on record that, throughout the whole of their proceedings, they have met with the determined hostility of all the metropolitan gas companies which supply districts outside the City, excepting the South Metropolitan Gas Company. This opposition, however, as might have been foretold, proved utterly unavailing.

The directors believe that the settlement of the gas question arrived at as regards the City of London will form a precedent in the next session with respect to the rest of the metropolis; and they venture, therefore, to indulge in the hope that the public may at length be satisfied, and that the item "Parliamentary expenses" may shortly disappear altogether from their accounts.

The Saville House claims, so often before alluded to, still remain undecided upon; but it is believed that the award of the arbitrator will shortly be made.

The condition of the company's works and plant generally calling for no special remark, the directors have further only to state that the total profit for the half year ending at Midsummer last enables them to recommend a dividend at the rate of 7 per cent. per annum; and, as this is payable on an increased amount of capital, the working of the company may be regarded as not unsatisfactory.

Pursuant to the provisions of the company's Act, the half-yearly ordinary general meetings of the company will for the future be held in the months of April and October, instead of in the months of May and November as heretofore; and the warrants for the dividend then declared will be transmitted to the shareholders by post, in the usual manner, fourteen days after the day of meeting.

Profit and Loss Account, from December 25, 1867, to June 24, 1868.

Dr.			*Cr.*		
To Coals consumed in the half year, including labour		£78,200 18 7	By Rental of light for the half year		£137,598 9 10
Stores, &c., used in the half year, viz.:—			Coke and breeze, deducting labour, viz.:—		
Retorts and setting, including labour		3,571 6 0	Coke	£18,982 6 1	
Lamps and lamp lighting, ditto		2,326 4 5	Breeze	231 8 8	
General wear and tear, and mains	£6,651 15 1				19,213 14 9
Less received for old and burnt stores	455 16 4		Tar and other products, deducting labour		3,894 15 11
		6,195 18 9	Poplar station rent account, balance		12 1 9
Carrying on the works		2,820 12 0	Rents received		376 19 6
Meters and fixing, including labour		3,860 13 8			
Paving		1,532 5 11			
Directors and auditors		1,495 4 0			
Salaries and commissions		6,990 9 6			
Wages and contingencies, viz.:—					
Wages	£15,029 3 10				
Contingencies	640 14 0				
		15,669 17 10			
Rent and taxes, viz.:—					
Rent	£1,026 18 10				
Taxes	3,795 18 11				
		4,822 17 9			
Income-tax		879 11 3			
Law expenses		57 17 11			
Annuities to superannuated officers and workmen		589 8 2			
Debts due, being bad, written off	£904 15 7				
Received on bad debts	25 7 3				
		879 8 4			
Depreciation of gasholders and coal-store on leasehold property		100 0 0			
Interest paid on loan from bankers		663 15 1			
		£130,656 9 2			
Balance		30,439 12 7			
		£161,096 1 9			£161,096 1 9

Balance-Sheet, June 24, 1868.

Dr.			*Cr.*		
To 1st, 2nd, and 3rd capitals		£600,000 0 0	By Amount due to the company, viz.:—		
Fourth capital		240,000 0 0	For rent of light at the several stations, viz.:—		
		£840,000 0 0	Westminster station	£38,081 17 7	
Expended, viz.:—			Brick Lane ditto	13,368 15 5	
Westminster station—			Curtain Road ditto	8,246 16 9	
Balance at Christmas	£500,115 8 6				£59,697 9 9
Brick Lane station—			For coke and breeze sold at the stations, viz.:—		
Balance at Christmas	£186,050 16 2		Westminster station	£874 16 7	
Expended this half year, viz.:—			Brick Lane ditto	1,102 10 11	
For new mains	448 13 1		Curtain Road ditto	325 6 9	
	186,499 9 3				2,302 14 3
Curtain Road station—			For tar and other products sold at the stations		12 14 10
Balance at Christmas	£91,367 7 0		Balances of sundry accounts due to the company		1,974 4 1
Expended this half year, viz.:—			Treasurer's accounts, viz.:—		
For new mains	£51 3 9		Balance of general account	£23,410 14 8	
	91,418 10 9		Ditto of dividend ditto	571 0 9	
Barking works	1,277 1 5				23,981 15 5
	779,310 9 11		Cash advanced to pay wages at the stations		1,135 0 0
	£60,689 10 1		Stores on hand, viz.:—		
Amount paid on calls due June 24	27,125 0 0		Westminster station	£2,360 1 7	
Dividends remaining unpaid	5,972 8 11		Brick Lane ditto	2,079 5 0	
Debts due by the company for coals, and to sundry tradesmen and others	8,634 16 5				4,439 6 7
Amount due to collectors for commission, viz.:—			Coals on hand, viz.:—		
Westminster station	£701 13 8		Westminster station	£23,902 12 4	
Brick Lane station	311 10 1		Brick Lane	5,612 17 4	
Curtain Road ditto	154 2 10		Curtain Road ditto	2,164 8 9	
	1,167 6 7		On shipboard	1,083 17 0	
Amount due for wages and contingencies, viz.:—					32,823 15 5
Westminster station	£802 9 7		Coke and breeze on hand, viz.:—		
Brick Lane ditto	408 15 11		Westminster station	£20 4 0	
Curtain Road ditto	232 12 9		Brick Lane ditto	17 14 4	
	1,443 18 3		Curtain Road ditto	150 19 9	
Amount due at chief office for contingencies	139 12 6				188 18 1
Balance of profit and loss, viz.:—			Tar and other products on hand		690 5 4
Balance to Dec. 25, 1867	£31,078 8 2		Ship *Dispatch*		849 2 2
Less half year's dividend on £839,965	£29,316 10 6		Depreciation-fund, for gasholders and coal-store on leasehold property, invested in the purchase of £1198 5s. 10d. Reduced Three per Cent. Annuities		1,092 9 1
Amount transferred to contingent-fund	1,500 0 0		Contingent-fund, invested in the purchase of £20,844 11s. 1d. Reduced Three per Cent. Annuities		19,544 12 3
	£30,816 10 6				
	£261 17 8				
Profit of the half year ending Midsummer, 1868	30,439 12 7				
	30,701 10 3				
Depreciation-fund, for gasholders and coal-store on leasehold property, at Christmas, 1867	£1,210 2 6				
Add proportion for this half year	100 0 0				
Ditto dividend received on amount invested	17 10 6				
	1,327 13 6				
Contingent-fund at Christmas, 1867	£11,081 5 10				
Add amount transferred from profit and loss	1,500 0 0				
Ditto dividend received on amount invested	305 7 9				
	£12,886 13 7				
Deduct Saville House actions	£776 1 6				
Ditto accident in Summer Street	580 0 10				
	1,356 2 4				
	11,530 11 3				
	£148,732 7 3				£148,732 7 3

The GOVERNOR: Gentlemen, in appearing before you to-day, I think we have every reason to congratulate you upon the dividend that we have earned. It will not be necessary for me to go into all the proceedings of the company since our last half-yearly meeting, because the report gives you every information upon these matters, and they were explained to you—at least, to a great many of you—at the Wharncliffe meeting. If, however, there are any gentlemen present who did not attend that meeting, and now wish for any information, I shall be very happy to give it them if they will put their questions to me at a subsequent stage of these proceedings. The dividend recommended is 7 per cent., and that I may say has been all fairly earned from trade profit. If you look at the accounts for this time last year, you will see that part of the dividend then declared—£5000—was made by profit on the resale of Boghead coal, and we could then only pay the same amount as we now recommend. The present dividend is derived entirely from trade profit, and I think, when I tell you the advantageous working of the company during the past half year, you will be satisfied that it has been fairly and honestly earned. I will give you, as I usually do, the particulars of the working of the half year. In 1867 we used 81,649 tons of coals, at a cost of £79,421. In 1868 we used only 78,667 tons of coals, at a cost of £78,200. The cost per ton of coal has been more, but we have used less coal and got more gas. The decrease of coals in quantity is 3¾ per cent., and the decrease in money is 1½ per cent. In 1867 Boghead and cannel coal was 14⅜ per cent. of the whole quantity, and in 1868 it was 13¼ per cent. of the whole quantity, being a decrease of 1½ per cent. The cubic feet of gas made was 778,690,000 in 1867, as against 782,316,000 in 1868; so that, with so many tons less coal, we made so much more gas—the increase in the quantity of gas made being ½ per cent., with less coal. The gas per ton of coal in 1867 was 9537 cubic feet, and in 1868 it was 9944 cubic feet per ton of coal; so that the increase of gas per ton was 4⅓ per cent. The rental of light in 1867 was £134,580, and in 1868, £137,598—an increase of £3000, equal to 2¼ per cent. The products in 1867 were £22,918, and in 1868, £23,108, being an increase of ⅝ per cent. The rental per ton of coal in 1867 was 32s. 11½d., and in 1868, 34s. 11¾d., being an increased rental per ton of 6 per cent. The net cost of coals per ton, deducting products, in 1867, was 13s. 10d., and in 1868, 14s., being an increase in the cost of coal of 1¼ per cent. Retorts per ton of coals, in 1867, 11¾d.; and in 1868, 10⅝d., being 8½ per cent. to the benefit of the company. Then there is the general wear and tear per ton of coals, in 1867, 1s. 11½d.; in 1868, 1s. 7d. only, being a decrease of 19 per cent. Wages and contingencies per ton of coal, 4s. 2¼d. in 1867, and 4s. in 1868, being a diminution of 5 per cent. Rental realized per 1000 feet of gas, 3s. 5½d. in 1867, and 3s. 6¼d. in 1868, being an increase of 1⅝ per cent. The coke for sale in 1867 was 57¼ per cent. of coals used, and in 1868, 57⅝, being an increase of ½ per cent.; so that all the workings upon the half year have been most beneficial and advantageous to the company, and I think we have reason to congratulate ourselves upon such a result. We have made several alterations in the mode of setting the retorts and putting the pipes, which have given us a large increase in the gas, amounting, as you see, to 400 feet per ton of coals. I think, upon the whole, our position is most satisfactory. I have now only to move that the report be adopted; and if any gentleman has any questions to ask, I shall be happy to answer them.

The Hon. R. H. BROWNE (deputy-governor) seconded the motion.

Mr. GRAY: It was not my intention to have said a word on the present occasion, but the report which has been sent to us is, I think, in every way so satisfactory that I should be wanting in duty to myself and to you—for I am sure that I speak in the name of the proprietors as well as on my own behalf—if I were not to express our very great satisfaction at the prosperous state of the company. My own deliberate opinion is this, that, having made an arrangement which met with the concurrence of the House of Commons, I think there is every prospect, when the works are brought into operation, that very great benefit will result, not only to this company, but eventually to all the other companies in the metropolis. The course which has been pursued by the directors is highly creditable. They struggled on for a long time, but when they found that any further opposition would only involve them in greater expense, they very wisely came to a resolution to take the Act in the way in which it was proposed by the committee. I have no doubt whatever that they have acted with the greatest discretion, and I believe that eventually you will find the benefit of it. With reference to the opposition of the outlying companies, I was of opinion that it was unwise in them to take the course they did, because the arrangement made by this company will no doubt be forced upon the companies who may have to go to Parliament for fresh powers. I am perfectly satisfied with the proceedings of our directors, and I can say without hesitation that they are entitled to the gratitude and the confidence of the proprietors.

Mr. HOBSON (of Sheffield) assured the meeting that persons in the country watched with considerable interest the battle of the gas companies and the corporation of London, and he, for one, must congratulate the directors on having fought a very arduous battle, and having gained what, under the circumstances, was a victory, though it was hardly a perfect victory, inasmuch as they had more duties to perform. His experience as a gas director extended over a period of ten years, and therefore he thought what was required of them, under the new scale of prices, was no more than they could faithfully perform. At present they seemed to supply 14-candle gas, and he found that Dr. Letheby gave the average as 13·4, which was nearly up to the standard.

The GOVERNOR: We are only bound to give 12.

Mr. HOBSON was aware of that, but they were going to make it 16-candle gas, and they would find they must use coal which would give a greater quantity of gas per ton. If he might be permitted, he would suggest that South Yorkshire coal was better than Newcastle. He understood their tariff was to be reduced in 1870 to 3s. 9d. per 1000, and that being the case he thought they would have to go to the best market in order to make their business remunerative. He spoke from experience when he said that South Yorkshire coal would make 16-candle gas with a very small admixture of cannel coal. It was important, therefore, that they should get into communication with the South Yorkshire collieries, and he hoped they would be able to do so on favourable terms before the new price came into operation. He was glad that the company had earned 7 per cent. In Yorkshire, however, they would not have been satisfied with less than 10 per cent.; but then they were favourably circumstanced, getting coals at a cheaper rate—though, on the other hand, their price of gas was 3s. 6d., whilst in this company at present it was 4s. When they had to give 16-candle gas at 3s. 9d., the reduced price, they would then charge 3d. higher than in Yorkshire; but, of course, they were fully entitled to the extra 3d., owing to the cost of conveying the coals to London. When the company had once reduced their price, they must not imagine, because they had an Act of Parliament which enabled them to go back to the old scale in a year or two, if the new scale did not pay, that they would be able to do so, and charge 4s. as at present. That might sound very pretty in an Act of Parliament, but only let them put it into practice, and see what a storm would be raised by the public. If they could prove that they had done the very best they possibly could to make a profit out of the 3s. 9d. rate, and had not succeeded, it might not be impossible to raise the price. His experience as a director showed him that when they had once reduced the price they could never get back again to the old scale. It had been so in the company with which he was connected.

The GOVERNOR: But you have always paid your dividends.

Mr. HOBSON said they had always paid 10 per cent. What he wanted to impress upon the meeting was this: they had got power in their new Act to go back—they had a right to have that power, and he was glad they had it—but they must try to work the concern so that they might not require to go back to 4s., or any other sum, or if they did they would raise a storm of opposition which would make this company anything but popular with the public. Their business was to get such coal as would enable them to make a profit on their gas at 3s. 9d., and that, he considered, was quite possible. He did not come there to despond, but rather to congratulate the directors on having fought a good battle, for he thought they were squeezed very hard by the chairman of the committee. Another point to be borne in mind was that the South Yorkshire coal made a fair coke, and they could use most of it, but cannel made a bad coke. If they could use coal where but little cannel was required to be mixed with it, the coke would be more valuable. He hoped these points would be attended to, and that the directors would put themselves in communication with the best collieries, and consider the best means of working the company economically, due regard being had to the quality of the gas.

The GOVERNOR: I am sure that, from the observations the honourable proprietor has made, he thinks that we do not use every means in our power to get a supply of the best material, and that we are behind them in Sheffield in this respect. The fact is that hardly a week—certainly not a month—passes that we do not put ourselves in communication with parties who have coals to sell, to see whether we can deal with them advantageously. It is a mere question of price. We order a cargo of 500 tons of coal in order to try it in every way, and that happens not once or twice, but many times a year, just as offers are made to us. We make every trial and inquiry possible, with a view to benefit the company, and I think we have been in communication with certain parties regarding this very South Yorkshire coal of which the honourable proprietor has spoken. I hope the opening of the Midland Railway into London will save us a great deal in carriage, and the question resolves itself into that. If that line will save us what we anticipate, then the South Yorkshire coal will answer; but if it will not save us in carriage, then it will not answer. I am sure that no stone is left unturned to work the company economically. The great difference in the profits this half year, as compared with the preceding, has arisen from an alteration in the pipes which go from the retorts, which prevents their clogging, and saves the labour of cleaning them, besides giving us a large increase of gas, which was wasted every time they were cleaned. That alone has given us a return this half year. We have most able officers, who are always alive to everything that is going on, and who report everything to us. There is not a single thing that takes place that we do not inquire into, so as to see whether or not it may answer for our purpose. As the honourable proprietor has not been here before, probably he does not know of our arrangements. The outlay we contemplated making at Barking was £526,000. We have entered into a contract with the Weardale Iron Company for our mains to the extent of £70,000, which is £6000 less than our estimate. We have also entered into a contract for a river-wall for £400 less than our estimate, and I have no reason to doubt but that the whole of our works will be carried out upon the same scale. We have obtained permission of the Conservators of the Thames to bring out a pier to low-water mark, which will render, temporarily at least, a dock unnecessary, and we shall for the present save upon that alone £60,000; so that we have every prospect—I do not say in two years, but I think soon after two years—of paying 10 per cent. without any difficulty, with a reduced charge for gas and an increased illuminating power. When we come to have the City Company joined with us we shall have so many million cubic feet of gas to make for them, upon which a saving will arise as well as upon our own; and I think I may safely say, as I have said in this room before, that there is a fine prospect before us. I have never despaired—and I am sure I ought not to now—of this becoming the first gas company in the world, as I believe it will be.

The motion for the adoption of the report and accounts was then put, and carried unanimously, and a dividend at the rate of 7 per cent. per annum, for the half year ending at Midsummer last, was declared.

Mr. HOBSON asked whether the directors would not, as a matter of policy, call up all the money on the old stock before they issued the new stock.

The GOVERNOR said they would, of course, clear off the old account, which was only £30,000. They had borrowed £300,000 at 4½ per cent., and they would not raise one shilling of share capital till that was expended.

Mr. GRAY remarked that it would be highly undesirable to call up capital on which they expected to pay 10 per cent. before they had spent what they had already raised.

The SECRETARY then brought up a report from the directors, recommending an allowance to a retiring officer, for the confirmation of the meeting.

The GOVERNOR mentioned that the officer in question was Mr. William Eldridge, coke clerk at one of the eastern stations, and he had been a most zealous and honest servant. His salary was £150 a year, and the directors felt that they were fully justified in awarding him a pension of £100 a year. He had been in the service of the company for 31 years, and was now 78 years of age, and they thought it was only fair to him that they should make him this allowance out of the profit and loss account.

Mr. GRAY was sure there could not be a difference of opinion as to their providing for their meritorious officers in the decline of life. The amount proposed was much less than he should have expected under the circumstances, but as it was recommended by the directors he had no doubt it had been fully considered, and therefore he had much pleasure in proposing it.

Mr. BURLS seconded the resolution, remarking that the recommendation said the amount should be paid out of the "profit and loss account," but he hoped it would come out of the "profit," and not out of the "loss" account.

The resolution was at once agreed to.

Mr. WARD said he held a resolution in his hand which he was sure the proprietors would be most anxious to carry. The circumstances of the company with regard to the election of directors were somewhat unusual at the present time, this being the first ordinary meeting which had been held under the Act which had been so well obtained for them. By the 37th clause it was provided that the directors at the time of the passing of that Act were to continue in office till the first ordinary meeting, when the

shareholders were at liberty to reject them, or to re-elect them if they were properly qualified. He thought that, after the report and the accounts which had been placed before the meeting, there could be no hesitation in re-electing the whole of the directors. When they considered the great disadvantages under which this company had laboured for so long, and which the directors had now taken steps to obviate by opening their new works at Barking, he thought it was perfectly clear that when those obstacles were thoroughly removed they would be able to make the reduction of 3d. per 1000, and give the best dividends that could be fairly and honestly earned. He therefore had great pleasure in proposing that the whole of the directors be continued in office till the ordinary meeting to be held in April, 1869.

Mr. HUTCHINSON seconded the resolution, which was carried with unanimity.

The GOVERNOR having briefly thanked the meeting for re-electing himself and colleagues, remarked that at the last meeting Mr. Price gave notice of motion with reference to the payment of a sum of money to Mr. Phillips and Mr. Evans; but it appeared that he was absent from town with his family, and could not, therefore, propose the motion. He (the governor) did not know whether Mr. Price had asked any gentleman present to move it for him. If he had not, it must stand over till the next meeting.

Mr. GRAY did not think it was necessary to postpone the question till the next meeting, and as he consented to support any resolution on the subject, he thought that, in Mr. Price's absence, he was quite justified in undertaking this agreeable duty himself. He had had frequent intercourse with their secretary, and from what he knew of him he was sure that no one could have rendered greater service to the company generally than their worthy friend had done. He was fairly entitled to some acknowledgment for the extra labour that had been thrown upon him in connexion with the parliamentary proceedings. He (Mr. Gray) had not been in communication with any one else as to the amount that ought to be proposed, but some little time ago there was a vote of, he thought, 300 guineas to Mr. Chubb, and they would perhaps be guided by that. Then there was another officer, Mr. Evans, and he was sure that any one who had the pleasure of knowing him would bear testimony to the indefatigable manner in which he performed his duties as engineer to that company. Mr. Evans was always willing to render assistance to those who required it. It was not surprising that when an engineer was appointed he had not had, perhaps, so much experience as Mr. Evans had had, and it was very pleasant to find that, when such was the case, Mr. Evans was willing on all occasions to give his best advice and assistance. He (Mr. Gray) thought he had said quite enough of these two gentlemen to induce the proprietors to entertain the proposition. In his opinion it was the worst economy to give inadequate remuneration to their officers. Reward sweetened labour. He should, therefore, propose that an award of 300 guineas be given to Mr. Phillips in recognition of his services; and as he did not wish to make any difference between the two officers, he should propose also that 300 guineas be given to Mr. Evans.

Mr. HOUSON seconded the motion.

The GOVERNOR observed that this was a question which the directors had left entirely to the proprietors, but he thought he should be doing an injustice to Mr. Phillips and Mr. Evans if he did not, on behalf of the directors, testify to the great ability and zeal which they had shown in the interests of the company during the contests they had had in the last two or three years in Parliament. He believed that Mr. Phillips, from his thorough knowledge of parliamentary business, had saved the company double and treble the money they now proposed to vote, from the mode in which the business had been carried on. Things which might have given them a good deal of trouble and put them to much expense he had rendered quite smooth, and therefore, upon that ground alone, he (the governor) should be delighted to hear that the proprietors had voted him (Mr. Phillips) a sum of money in recognition of his services. Not only upon these occasions, but upon all occasions, his heart was in the business, and he (the governor) never considered that a man could be overpaid who gave his whole mind to what he undertook. With respect to Mr. Evans, it was impossible to say too much as to his qualifications and his zeal in the service of the company. One of the strongest testimonies to his ability was to be found in the fact that, though he was an officer of that company, the Government had appointed him as one of the gas referees to decide upon the nature of the illuminating power of the gas to be supplied by all the companies which light the City. The Government certainly could not have made a better choice, not only in consequence of the great knowledge which he possessed, but because of his strict integrity and the impartiality he always manifested. Though the public might at first sight suppose his decisions would be partial, he (the governor) was sure that when they saw the mode in which his duties were carried out they would be quite satisfied with him. His practical knowledge was brought to bear upon everything that came before him, and his integrity was unimpeachable. Therefore he (the governor) hoped, on his own behalf and that of his brother directors, that this motion would be agreed to.

Mr. BURLS remarked that if any gentleman wanted to know what work was, he had better put himself on the earliest possible occasion in connexion with a parliamentary committee in the House of Commons. If any gentleman supposed, as he did not imagine any one did, that the salary of an ordinary officer of a public company was sufficient when he suddenly found himself involved in the duties of Standing Orders, he made a great mistake. He had been through it once himself, and knew what it was. This had not been the only session in which the time—and what was more killing, the anxiety—of these gentlemen had been consumed on behalf of the company. It was the second occasion, at least, and, for aught he knew, the third, and who should say when it would happen again? If they were were going to keep their stable in order, they must at least provide good fodder. He could only say that the sum proposed seemed to him rather small, but he was only too glad that so small an act of justice was about to be done to their worthy officers.

Mr. YOOL drew attention to the fact that throughout the whole of the parliamentary session the chief officers of the company were most ably assisted by two other officers whose names had not been mentioned. He alluded to Mr. Bush, the accountant, and Mr. Reeson, who had ably assisted Mr. Phillips. He trusted that, when this motion had been passed, it would be left to the directors to consider whether a sum of money ought not to be awarded to those gentlemen, who had worked early and late on behalf of the company.

The motion was then put, and carried with great cordiality, one proprietor only voting in the negative.

Mr. PHILLIPS: Gentlemen, I beg to thank you for myself very earnestly indeed for the substantial mark which you have given me of your appreciation of my services. Much remains still to be done, but I do trust that the success which has been achieved will continue to attend as the result of the labours of myself and my brother officers.

Mr. EVANS: I beg to thank you, gentlemen, most sincerely for this great mark of your confidence in me, and reward for services that I have rendered to you, and I can assure you that my future efforts will be directed to the prosperity of the Chartered Gas Company.

Mr. YOOL ventured to hope that the directors would take his suggestion into their consideration.

The GOVERNOR intimated that they would be happy to give it their attention.

On the motion of Mr. GRAY, seconded by Mr. HEDGES, a cordial vote of thanks was then given to the governor and directors for their attention to the interests of the company.

The GOVERNOR briefly acknowledged the compliment, assuring the meeting that it was the most anxious desire of the board on all occasions to do the best they possibly could for the company, and to increase the profits.

Mr. WARD proposed that a vote of thanks be given to the auditors, and it was at once agreed to, and acknowledged by Mr. BARKER.

The proceedings then terminated.

DR. FRANKLAND'S ANALYSIS OF THE METROPOLITAN WATERS IN SEPTEMBER, 1868.—"Royal College of Chemistry, Sept. 23, 1868.—Sir,—I have the honour to submit to you in the following table the results of the chemical examination of the waters supplied to the metropolis during the month of September. For the purpose of comparison I append also the results yielded by Loch Katrine water, as supplied to Glasgow, and by the waters supplied to the towns of Lancaster, Manchester, Leicester, Preston, and Worthing, when submitted to the same analytical processes. The Southwark Company's water was exceptionally polluted, containing an excess of 13·2 parts of solid impurity. It was also harder, and contained more organic matter and previous sewage contamination than any other sample of Thames water. Much of this excess of impurity is due to common salt, of which it contained no less than 13·2 parts in 100,000. The Southwark and East London Companies waters had traces of suspended matter in them; the rest were perfectly clear and transparent.

Companies.	Date and Place of Collection.	Temperature in Cent. Degrees.	Total Solid Impurity in 100,000 Parts.	Organic Carbon.	Organic Nitrogen.	Nitrogen, as Nitrates and Nitrites.	Ammonia.	Total combined Nitrogen.	Previous Sewage Contamination (Estimated).	Total Hardness.
Thames.	Temp. of Thames —Sept.	Cent. 16·11								
Chelsea.....	Sept 10—Cab Rk., Horse Guards ..	18·9	25·4	·142	·025	·066	·001	·092	350	18·3
West Middlesex	Sept 10—Cab Rk., Portland Road ..	18·9	24·4	·108	·017	·075	·001	·093	440	17·4
Southwark & Vauxhall..	Sept 10—Cb R., St. George's Ch., Bo.	19·4	38·6	·194	·028	·122	·001	·151	910	21·4
Grand Junction.....	Sept 10—Cab Rk., Woodstock St. ..	17·8	24·2	·129	·016	·088	·001	·105	570	16·5
Lambeth	Sept 10—Cab Rk., Lambeth Road..	18·6	25·4	·133	·020	·106	·001	·127	750	18·6
Other Sources										
New River...	Sept 10—Cab Rk., Tottenham Ct.Rd.	19·1	24·8	·045	·012	·152	·000	·164	1200	18·0
East London.	Sept 10 — Slater's, Old Ford Road .	18·3	24·2	·041	·016	·033	·001	·050	20	17·9
Kent.....	Sept 11 — Deptford Bdge. Police Stat.	13·3	41·0	·014	·007	·387	·000	·394	3550	27·1
Loch Katrine	July, 1867, Glasgow		3·0	·161	·011	·000	·001	·012	0	0·3
Lancaster ...	Sept.—Lancaster .		3·5	·157	·001	·036	·001	·038	50	0·1
Manchester..	June—Manchester		6·2	·183	·009	·025	·006	·039	0	3·7
Leicester	Nov.—Leicester ..		23 7	·506	·020	·001	·001	·022	0	13·4
Preston	Dec.—Preston		14·7	·515	·040	·001	·003	·044	0	6·7
Worthing ...	Nov.—Worthing..		36·7	·162	·000	·426	·000	·426	3940	23·8
Column 1	2	3	4	5	6	7	8	9	10	11

The numbers in columns 4, 5, 6, 7, 8, 9, 10, and 11 all relate to 100,000 parts of the waters. The table is to be read thus: The Chelsea Company's water collected on Sept. 10, at the Horse Guards cab rank, had a temperature of 18·9° Cent.; 100,000 lbs. of it contained 25·4 lbs. of solid impurity; the organic matter, constituting a portion of this impurity, contained ·142 lb. of carbon and ·025 lb. of nitrogen. This solid impurity also contained ·066 lb. of nitrogen in the form of nitrates and nitrites, besides ·001 lb. of ammonia; whilst the total amount of *combined* nitrogen in every form was ·092 lb. The above quantity of water supplied by the Chelsea Company had been, after its descent to the earth as rain, contaminated with sewage or manure matter equivalent to 350 lbs. of average filtered London sewage. By gradual oxidation, partly in the pores of the soil, partly in the Thames and its tributaries, and partly in the reservoirs, filters, and conduits of the company, this sewage contamination had been converted into innocuous inorganic compounds before its delivery to consumers. Finally, 100,000 lbs. of the Chelsea Company's water contained 18·3 lbs. of carbonate of lime, or an equivalent quantity of other soap-destroying ingredients.—I have, &c., E. FRANKLAND.—The Registrar-General, &c."

SHEPPY GAS CONSUMERS COMPANY, LIMITE .

The Half-Yearly Ordinary General Meeting of this Company, which supplies the town and Government establishments at Sheerness, and the borough of Queenborough, was held on Tuesday, Sept. 29, at Sheerness—C. ALLEN, Esq., in the chair.

The SECRETARY (Mr. A. W. Marks) read the report, as follows:—

The directors have to congratulate the shareholders on the satisfactory completion of the business of the half year.

The entire plant is in excellent condition. The larger main for the supply of Marine Town has been completed. The plant of the company is now in all respects capable of economically meeting any probable demand for increased consumption in the district.

The large amount which it has been found necessary to expend on improvements to the roads and land at West Minster, the property of the company, has been temporarily taken from the trading capital; but, as it will shortly be necessary to recoup this amount, the directors propose borrowing the sum of £400, to be gradually repaid out of the surplus profits of the company, or by the proceeds of the sale of any of the land which may in the meantime be disposed of. During this

year the directors contemplate writing off a sum of £50 from the balance of unappropriated profits of last year.

Mr. George Hare having resigned his seat as a director, Mr. Henry George Clarkson has been chosen by the board to fill the vacancy.

The unusual length of the daylight during the past exceptionably fine season has prevented the increase of consumption being in the ordinary ratio. This result, together with the reduced rate of the new Admiralty contract, has, to a certain extent, reduced the profit arising from the trade of the half year.

The sum required for the payment of the usual half-yearly dividends is £845. As a considerable surplus of undivided profit has been brought forward from 1867, and the anticipated profit on the second half of the year will, it is believed, afford a further surplus, the directors feel justified in advising that the ordinary rate of dividends should be maintained, viz.—

A dividend after the rate of 2s. per share for the half year upon the 4 per cent. preference shares.

A dividend after the rate of 10 per cent. per annum, or 5s. per share for the half year, upon the ordinary shares, and 2s. per share on the A shares.

Such dividends to be all payable on or after the 1st day of November next, by dividend warrants to be forwarded to each shareholder.

Dr. *Trade Account, for the First Half of the Year* 1868. *Cr.*

To Coals carbonized	£1,253	17	1	By Gas-rental, meter and fittings hire (net)	£2,597	12	8
Purifying materials	29	5	6	Coke and tar produced	494	14	6
Wages on manufacture and distribution	367	11	6	Coals sold at works	31	10	0
Manager's salary	85	0	0	Water ditto ditto	5	4	5
Auditor's ditto	7	10	0	Gas-fittings	24	16	10
Secretary's commission	105	0	0	Transfer fees	2	0	0
Directors fees	25	0	0	Miscellaneous	9	8	4
Rents, rates, taxes, &c.	78	14	3				
Stationery, stamps, and incidentals	18	2	2				
Repairs, renewals, tools, and stores	68	12	4				
Retort account	60	0	0				
Bad and questionable debts	30	0	0				
Deterioration account	100	0	0				
Coals for sale	22	16	9				
Gas-fittings and wages thereon	20	9	6				
Repair of river wall	4	10	0				
Interest on mortgage loan	93	8	4				
Profit upon half year's working	795	9	4				
	£3,165	6	9		£3,165	6	9

On the motion of the CHAIRMAN, seconded by Mr. J. BARNABY, the report read, and the accounts, which were taken as read, were unanimously received and adopted.

Mr. J. COLE moved, and Mr. R. MURTON seconded, the motion for the declaration of a dividend of 2s. per share for the half year on the 4 per cent. preference shares, and dividends of 5s. and 2s. per share—or 10 per cent. per annum—on the ordinary and A shares respectively, which was carried *nem. con.*

The CHAIRMAN, in responding to a vote of thanks for his conduct in presiding, congratulated the shareholders on the prosperous position of the company, and expressed the hope that they should meet on many future occasions under as favourable auspices as they then met.

SOUTH METROPOLITAN GASLIGHT AND COKE COMPANY.

The Half-Yearly Ordinary Meeting of Proprietors was held at the London Tavern, on Monday, Oct. 5—T. B. SIMPSON, Esq., in the chair.

The SECRETARY (Mr. Livesey) read the notice of the present meeting, and the minutes of the last meeting. The corporate seal of the company was affixed to the register of proprietors, and the following report was then submitted:—

At the last meeting of proprietors the directors reported that the capital of the company had all been called up and was very nearly exhausted, so that it would be necessary to seek power from Parliament to raise an additional sum. The directors still retain that opinion, and think it not unlikely they must very shortly ask the proprietors to hold another meeting on that subject.

The directors also at the last meeting informed the proprietors that two bills had been introduced into Parliament to regulate the price of gas and other matters connected with the several London gas companies, and that they had considered it necessary to petition the House of Commons against both bills. Since then, as many of the proprietors are doubtless aware, one bill for regulating the supply of gas in the City passed both Houses of Parliament; the other was withdrawn.

The business of the company continues to increase, the rental for the half year being nearly £2000 in excess of the preceding six months.

The works are in good condition, and the business is conducted generally to the satisfaction of the consumers. The gas supplied is always above the standard, and free from the impurities of ammonia and sulphuretted hydrogen.

The new church erected in the Old Kent Road, under the authority of the company's Act of Parliament, has been consecrated, and is now in use for public worship. The old church will shortly be taken down, and the site added to the works.

The rental for gas, and receipts for products, &c., for the half year to the 30th of June last, amount to £52,002 3s., and the expenditure for the same period to £39,038 3s. 7d., leaving a balance of £12,963 19s. 5d. for payment of the usual dividend.

The CHAIRMAN: Gentlemen, in rising to move that the report be received, I have only one or two remarks to make to you. The first thing I have to say is that the whole of our works and property generally is in a most efficient state and condition, and calculated to last for many years to come without any serious expense, except for such enlargements as the extension of our business may from time to time require. But, gentlemen, I cannot help making an observation on this occasion upon the extremely vexatious position in which gas property has lately been placed by the continued agitation which has been got up against us by a few individuals—for in truth I may say that there is only about a dozen persons who have caused the commotion. Knowing as I do the pains and care which have been taken by the gas companies, at all times, that the public shall be well and properly supplied, and believing that we are furnishing as good gas as can possibly be sold at the price—better even than we are required to do by the terms of our Act of Parliament—I cannot but feel that the outcry raised against us is unjust in every respect. I can speak very confidently with regard to this company, that we are most desirous, on all occasions, to fulfil our obligations to the public; and I can safely say that, until this agitation took place, no company had a more satisfied body of consumers. But they have been told so often that they are ill used, and over charged, and oppressed, and that the gas supplied is not what it ought to be, that it is enough to raise discontent amongst those who otherwise would be perfectly content, and who really are without any ground whatever of complaint against us. Gentlemen, you are all aware of the bills which were passed in Parliament, during the last session, on the subject of the supply of gas in the metropolis, and you know what arbitrary powers have been taken under those bills. The fact is, they have almost taken upon themselves to be the gas-makers, and left the proprietors of the works little more to do than to look on, or to act under their government. It is true that at present those bills are confined to the City of London, but I suppose shortly we shall all be required to come under similar provisions—the Chartered Company even now being subject to the same regulations in their district outside the City. At the same time there is some hope, from the fact of referees being appointed and a power of revising prices being reserved, that the companies may still be able to earn their 10 per cent; although as all fines, however they may arise, are to come out of dividends, and the expenses of those who are appointed to look after us are to be borne out of the revenues of the companies—for instance, the salaries of the gas referees, the gas examiners, and the public auditors. Very onerous obligations are imposed upon us, and to a small company like this these things may militate very greatly against our being able to continue our 10 per cent. In the case of companies having large capitals the fines will be a comparatively unimportant matter, but companies with small capitals will feel them very seriously, and I think an alteration is required in their behalf. I merely touch upon these things in passing now, because at present they do not concern us, though eventually they may do so. The next matter upon which I must say a word is that we are now, or soon shall be, in want of money, and we have no means of obtaining it except by applying to Parliament. But here comes a difficulty; and the question is, shall we apply to Parliament, and accept the stringent clauses to which the City companies have had to submit, for we cannot hope for better, or shall we go on as long as we can without applying to the Legislature? If we adopt the latter course we shall be put to great inconvenience, because our business is largely increasing, and we must expend capital for the enlargement of gasholders and things of that sort. Looking at the matter on all hands, it is most probable, therefore, that we shall have to call you together again and ask your opinion, at no distant day, as to the course we should adopt. The directors will seriously consider the position of the company and the best means of securing its efficiency, and they will then come before you with the result of their deliberations, and ask your consent and approval to the course they will recommend. I believe, gentlemen, I have no further observations to make to you, and will therefore at once move the adoption of the report.

A PROPRIETOR: What is the probable amount of new capital you will require?

The CHAIRMAN: It would be useless going to Parliament for less than double what we now have. Our business increases so rapidly that if we did we should before long have to go again. We should not, of course, raise all that we took power for at once, but only as we require it.

Captain HENNING: How much would it be in all?

The CHAIRMAN: £250,000.

Mr. MAUGHAN: As the time for giving parliamentary notices is so close at hand, I am rather sorry to hear the chairman speak in hesitating tones on the subject. I hoped, from what was said in the report, to find that the directors had made up their minds to promote a bill next session. It appears to me to be absolutely necessary that you should obtain powers to raise fresh capital to meet the increased demands made upon the company, and I do not think you will ever go to Parliament under circumstances more favourable than the present. There is no doubt the legislation of the last session will be the guide for many years to come, and I do not think you will at all benefit yourselves by delaying to apply to Parliament as early as possible.

Mr. GRAY: I must differ from the remarks of my worthy friend. I think it very inexpedient at the present time to come to any resolution with regard to going to Parliament. I have had sufficient experience of Parliament to know what it is capable of doing, and I think it not improbable that if you go there very stringent regulations will be imposed upon you, which will materially interfere with the welfare of the company. It is perfectly clear to all who have watched the recent proceedings of committees of the House of Commons that there is a very strong feeling against gas companies, although I fearlessly say that no associations of men have shown a more earnest desire and determination to do justice to the public. It is obviously our duty to conciliate our consumers by meeting all their reasonable requirements, but we must take care that we do not yield to such as are unreasonable, and thus damage the interests of those whose property is at stake in these undertakings. I have no doubt the chairman and directors of this company will keep a watchful eye upon the concern, and will take such steps as are necessary to be taken to extend and enlarge the works to meet the requirements of the business and increase our revenue. But I should be sorry to force any scheme upon the directors; I would rather, from the way in which they have hitherto managed affairs, leave the whole matter to their discretion, satisfied that they will do everything in their power to protect our property. We do not at all know how the new Parliament may be constituted, but of one thing we may be sure, that if it should be capable of doing as much injustice to gas companies as the last, it will place our property in a very perilous condition. I hope, however, better things of it. We are told that reform is to improve everything. I sincerely hope the reformed Parliament will look after the manner in which expenses are incurred in committees of the House of Commons, for I unhesitatingly say that the mode in which business has been there conducted, and the frightful expenses to which companies have been put in the protection of their rights, amount to an absolute denial of justice. During the last seven or eight years £100,000 has been wasted in this manner in Parliament, the whole of which has had to come out of our revenue. During the last session very onerous conditions were forced upon the City companies; we were forced to accept them, for the chairman of the committee, Mr. Cardwell, was decidedly against us throughout. The same gentleman was chairman of the committee which sat upon and passed the Great Central Company's bill, and it subsequently turned out that many of the statements made by the advocates of that measure were utterly erroneous. And what had been the consequence? That bill inflicted enormous loss upon my company, and our shares, which had been as high as £280, were reduced to £74. We thought that we were protected by our Act of Parliament, but it appears that an Act of Parliament is no protection to any one. Well, gentlemen, I will only say in conclusion that, with reference to the report now presented, I think it reflects the highest credit upon our directors and the engineer of the company, and I trust that their good management will ensure to us a continuance of existing prosperity, and that the time is not far distant when the public will acknowledge that there is nothing in the conduct of gas companies to disentitle them to a fair return upon their capital, which is all that they demand.

Captain HEATHORN: I think if we go to Parliament now we shall only be carrying out the resolution which we came to some time ago. I believe it is the wish of every shareholder that we should go on as an independent company, and I think we shall find it easier to raise fresh capital now than we should do at a future time. If we get the power we need not use it until it is absolutely required, but having the power, we shall be able to raise the capital as the district we supply increases. As to the agitation which has been

referred to, I have no doubt that the public will find out that the great gas persecution has, after all, been in the hands of a few persons, and that in this instance, as in some others, the clamour for the luxury of inspection savours of a desire to get good places.

Mr. PAULL: Although I am one of the auditors of the company, I have had no communication with the directors in reference to the remarks I am about to make. In going through the accounts, and asking for various items of information, I ascertained that expenditure was being incurred, and must still be incurred, to meet the requirements of the company. How is that money to be found? Money has been spent, and must be spent. Are the directors to go on finding money themselves, or are they to pledge our credit for works which they are erecting, or are about to erect? I confess I think it is a pity that, in meeting us to-day, they did not come with some resolution recommending an application to Parliament, inasmuch as within the next few weeks the necessary notices must be given if an application is to be made next session. I make these observations, because I think it may be desirable for the proprietors to express an opinion at this meeting which shall enable the directors to come to a unanimous decision whether they will apply to Parliament during the next session or not. I am one of those who think it is better to go at once than to postpone the matter. I think the feeling of Parliament this year was more in favour of allowing companies to raise further capital on liberal terms than we may expect it will be hereafter. I agree with my friend, Mr. Gray, that committee-rooms are very unsatisfactory places to resort to, and that in them justice is very sparingly administered; but as that is the tribunal to which we must go, I believe we shall get better terms in 1869 than we shall do if we postpone our application. I desire to have the question of the propriety of doing so mooted at this meeting. I know nothing of the deliberations of the directors on the subject, but, as the matter has been brought before us, I think the shareholders should express an opinion which would strengthen the board in coming to a decision, bearing in mind that money has been spent, and must be spent, which will have to be recouped hereafter.

Mr. DREW: I think the real question is, whether we should go to Parliament, or borrow the money. We have never been in the habit of borrowing money, and we have no debt of that kind. No doubt we could raise money in that way at considerably less than 10 per cent.

A PROPRIETOR: The only question is as to its legality.

Mr. MAUGHAN: My conviction is that it would be quite illegal.

The CHAIRMAN: We should only do so under good advice. The question of raising additional money has only recently come before the board, and they have not as yet given it all that full and deliberate attention which it must have before any decision is come to. I believe we are in such a position that we can go on for another year or so without much inconvenience. The great point, therefore, now is as to the policy of going to Parliament at the present moment, and that, as I say, requires more consideration than can be given to it at the moment; but you may rest assured we shall seek the very best advice on the subject.

Mr. MAUGHAN: I am surprised to hear the doctrine which has been broached here to day, that you can borrow money for your purposes. All your borrowing powers are exhausted.

Mr. DREW: We never had any borrowing powers.

Mr. MAUGHAN: I apprehend you cannot apply any portion of the reserve-fund to the enlargement of the works, and, seeing that you have no other resource, I think, if you allow the present crisis to pass, it will be a matter much to be regretted. The chairman says the company may possibly go on without additional capital for another year, but unless you obtain parliamentary powers next session, it will be two years before you can legally raise fresh capital. You have a very large and important district, one which is increasing day by day. You must meet the wants of your consumers, and where is the money to come from?

The CHAIRMAN: I differ entirely from the honourable proprietor, for I think the company have power to borrow money.

Mr. MAUGHAN: I assure you, you have not; it would be utterly illegal.

The CHAIRMAN: Of course it is a matter for careful and deliberate consideration, but it is my opinion that we have power to borrow money on bonds, and that we can give a preference to those who lend us money in that way. We shall not lose sight of the matter; it will come before us in regular course, and if we find that we have no such power, we shall not attempt to exercise it. I certainly think it is desirable, if possible, to avoid going to Parliament, and exposing ourselves to the liability of being placed under more stringent regulations. However, we shall do nothing without previously consulting the proprietors.

Captain HENNING: Would it not be desirable that the directors should take the matter into their consideration, and then call the proprietors together, which they might do in sufficient time to give the requisite notices?

The CHAIRMAN: We should certainly do so.

Captain HEATHORN: Should we borrow money in the way suggested by Mr. Gray, we should not be able to represent that money as part of our capital in the event of a forced amalgamation.

The CHAIRMAN: I will just remind the meeting that Mr. Cardwell, the chairman of the committee of the House of Commons, stated plainly that, though they had no power to alter the organization of the companies without their consent, yet the time would come when we should have to come to Parliament for fresh capital, and then they could deal with us. It is not, therefore, advisable that we should go to Parliament, except we are absolutely compelled.

Mr. MAUGHAN: I am satisfied that the proposition to borrow money is *ultra vires*, and that the bonds would not be worth the paper they are written on. You have no power to do such a thing, and it is as well that that delusion should be disposed of as quickly as possible.

The CHAIRMAN: I need hardly say that we should not attempt to do it if it is illegal; and we shall be guided in the matter by sound legal advice.

A PROPRIETOR: And I understand you to say that before going to Parliament we shall be called together again.

The CHAIRMAN: Certainly; we should not go to Parliament without taking your opinion on the subject.

A PROPRIETOR: Have you the power to use your reserve-fund for the purpose of extensions?

The CHAIRMAN: We have not, and should not attempt so to employ it.

The PROPRIETOR: It seems to me desirable that we should avoid going to Parliament as long as we possibly can, or it may result in our having those obnoxious clauses thrust down our throats which are embodied in the legislation of last session. Probably, in the course of time, the public and the Legislature may come to a sense of what is due to those who have embarked their capital in such undertakings, and will see the impolicy of departing from the principles upon which we originally obtained our several Acts.

The motion for the adoption of the report was then put, and carried unanimously.

The SECRETARY then read the following statements of account:—

Working Account, June 30, 1868.

Dr.				*Cr.*			
To Gas-rental—				By Directors and auditors			
March 25	£26,532	2	3	Salaries and commissions	£650	0	0
June 24	14,624	13	7	Rent and taxes	1,985	12	11
Residual products	9,904	14	10	Stationery and general charges	1,528	11	1
Miscellaneous receipts	686	5	4	Supervision and labour	1,312	11	8
Old materials	254	7	0	Tools and implements	6,341	12	0
				Repair and maintenance	449	0	7
				Purifying and labour	1,318	11	9
				Coals carbonized	228	10	2
				Main-pipes relaid	20,177	5	8
				Service-pipes relaid	515	12	2
				Meters exchanged	195	11	11
				Distribution	1,116	12	5
				Bad debts and allowances	2,425	0	5
				Balance	793	10	10
					12,963	19	5
	£52,002	3	0		£52,002	3	0

Balance-Sheet, June 30, 1868.

Dr.				*Cr.*					
To Capital	£249,982	0	0	By Works	£199,926	6	0		
Reserve-fund	20,000	0	0	Freehold	35,547	17	2		
Payments in advance	545	16	8					£235,474	3	2
Investment-fund	7,593	0	5	Stock—						
Unclaimed dividend	17	8	3	Coals	£4,604	12	1			
Sundry creditors	2,160	12	11	Products	254	3	0			
Revenue account	16,556	3	0	Mains	1,239	3	8			
				Service-pipe	198	19	2			
				Meters	1,584	0	6			
								7,880	18	5
				Amount due to the company for—						
				Gas	£15,746	8	7			
				Products	873	12	11			
				Sundries	73	7	7			
				Interest	314	1	10			
								17,007	10	11
				Cash—						
				At bankers	£15,645	15	0			
				In hand for freight	300	0	0			
								15,945	15	0
				Consols				20,000	0	0
				Amount due from the estate of the late Sir C. R. Price				546	13	9
	£296,855	1	3					£296,855	1	3

On the motion of the CHAIRMAN, the accounts were received, and ordered to be entered on the minutes.

A dividend at the rate of 10 per cent. per annum was then declared, payable on the 8th inst. In answer to a proprietor, it was stated that a further dividend under the estate of Sir Charles Price, the company's late banker, would probably be paid in the course of the present month.

On the motion of Mr. GRAY, a cordial and unanimous vote of thanks was offered to the directors for the manner in which they had watched over the company's affairs during the past half year.

The CHAIRMAN acknowledged the vote, which he said was peculiarly acceptable at a time when the duties devolving on the board were of so anxious and onerous a character. He was glad to find that the course hitherto pursued by the directors had met with the approval of the meeting, and that they still enjoyed the confidence and respect of the shareholders at large.

Mr. GRAY said the present position of the company was eminently due to the zeal and ability of their practical officers, without whose co-operation the well-designed plans of the directors must entirely fail. He had no hesitation in saying, in the presence of Mr. Livesey, that no engineer more efficiently performed his duties than he did. He invited the meeting to express the sense of the merits of Mr. Livesey by presenting him with a vote of thanks.

The resolution was unanimously adopted.

Mr. LIVESEY: Gentlemen, I thank you most sincerely for the kind vote you have just passed in my favour, and I hope always to continue to enjoy your good opinion.

IMPERIAL GASLIGHT AND COKE COMPANY.

The Half-Yearly General Meeting of the Proprietors of this Company was held at the Offices, John Street, Bedford Row, on Thursday, Oct. 8—E. V. Richards, Esq., the governor, presiding.

The Secretary (Mr. H. Chubb) read the advertisement convening the meeting, and the corporate seal was affixed to the register of proprietors.

The following report and statements of account were taken as read:—

The annexed statements of the accounts of the company show, in the usual form, the result of the working for the half year ending the 30th of June, 1868.

As compared with the corresponding period of 1867, there is an increase of £12,073 5s. 7d. on the gas-rental, but there is a decrease in the receipts from the sale of coke and other residual products amounting to £4553 7s. 4d.

The refusal of a parliamentary committee to allow the company any increase of capital, except upon conditions which your directors felt bound to decline, has compelled the further alteration of the company's works in such a manner as to involve a very large expenditure during the half year under the head of "Wear and tear," and the net balance available for dividend falls short of the amount required to pay the maximum rates by the sum of £14,816 9s. 4d. This deficiency, if not in part made good by the end of the present year, will have to be drawn from the reserve-fund.

Your directors now recommend that dividends at the rates of 7 and 10 per cent. be declared on the classes of shares respectively entitled thereto, the deficiency referred to being carried forward as a balance against the current half year.

It is probably within the knowledge of the proprietors that the bill promoted by the corporation of London in last session for power to construct gas-works of their own, and to enter into competition, at the risk of their corporate funds, with the three companies who supply the City, met with the approval of the select committee of the House of Commons, who, in fact, invited such a measure in their report of the previous session. Whether the committee would really have passed the Corporation Bill in the form in which it was presented to them may well be doubted, but they used it as an instrument to coerce the City companies into the acceptance of terms which one of them declared before the committee they regarded as "most onerous, and probably for some years ruinous." Those companies, however, believed that competition with the corporation of London under such unequal conditions involved the certain ruin of their undertakings, and they thought proper to yield to the views of the committee, by acquiescing in the passing of an Act applicable only to the City of London and to that portion of the metropolitan area outside the City which is lighted exclusively by the Chartered Company. That Act contains the stringent obligations which were sought to be imposed on the companies in the previous session, and which were then unanimously rejected by them, and your directors, rather than accept terms which they considered to be most injurious to your property, and in direct violation of the conditions upon which your capital was subscribed, preferred that the bill promoted by this company should again be withdrawn.

Your directors regret to state that Mr. James St. George Burke, Q.C., resigns his seat at the board.

Dr. — *Revenue Account, for the Half Year ending June 30, 1868.* — *Cr.*

To Coals consumed	£126,932	7	6	By Gas-rental	£255,971	15	10
Wages for manufactory	25,101	4	10	Meter-rental	2,165	11	10
Purifying, oil, and sundry stores	3,761	18	5	Coke	37,636	8	8
Wear and tear	40,881	8	9	Tar	3,714	14	9
Rent, rates, and taxes	8,543	16	4	Ammoniacal liquor	1,428	0	2
Directors and auditors	1,328	15	0				
Salaries and collectors commission	10,604	13	3				
Stationery, printing, and general charges	2,266	14	5				
Bad debts	1,913	15	0				
Law and parliamentary charges	3,560	17	3				
Compensation for damages	53	5	0				
Interest	86	15	6				
Profit and loss account	75,881	2	0				
	£300,916	11	3		£300,916	11	3

Dr. — *Profit and Loss Account.* — *Cr.*

To Dividend to Dec. 31, 1867	£68,425	11	8	By Balance from last account	£60,391	2	0
Contingency-fund	1,500	0	0	Reserve-fund	8,034	9	8
Interest on bonds, debentures, and paid-up shares	20,168	0	11	Contingency-fund	2,945	0	0
Parliamentary charges	2,945	0	0	Revenue account	75,881	2	0
Balance—being the profit for the half year	54,213	1	1				
	£147,251	13	8		£147,251	13	8

Dr. — *Balance-Sheet.* — *Cr.*

To Investment	£1,858,969	7	0	By Capital, joint-stock	£1,403,991	5	0
Reserve-fund invested	43,148	16	9	Proprietors 10 per cent. bonds	130,000	0	0
Contingency-fund ditto	38,065	18	7	Debenture capital	331,800	0	0
Cash for balance in hand and on deposit	123,616	0	10	Amount paid in anticipation of calls on 7 per cent. shares	169,404	0	0
Sundry debtors for gas, coke, &c.	121,531	17	2	Reserve-fund	43,148	6	9
Coals, coke, and stores, for stocks on hand	38,684	10	8	Contingency-fund	35,546	5	3
				Interest due on bonds, debentures, and paid-up shares	20,163	0	9
				Sundry creditors, for goods supplied to company, &c.	35,750	12	2
				Profit and loss	54,213	1	1
	£2,224,016	11	0		£2,224,016	11	0

The Governor: Gentlemen, it now becomes my duty to address a few observations to you in conformity with our usual habit, and I begin at once by confessing that the accounts now laid before you have somewhat disappointed me. I did hope we should be able to pay 10 per cent. on this occasion without having recourse at all to our reserve-fund. I was justified in this hope by the conviction, which subsequent events proved to be correct, that our rental for gas would increase. I find, on comparing the accounts, that it has increased to the extent of £12,000 during this half year; but, *per contra*, our receipts for residuals have diminished, and that, too, notwithstanding an increase of business to the extent of £5000. I can only say, with regard to that matter, we do our best to force sales of coke, and to get the very best price for it we can command in the market. You are aware that we cannot store coke or any of the residuals indefinitely, and that as soon as our stores are full we must get rid of them at the best prices of the day. We do all in our power to turn them to good account, and I only regret that the result is not more satisfactory than our accounts show it to have been. The "wear and tear" account is, for the reasons sufficiently stated in the report, considering the position in which we are this half year, again extremely large. I can only say, without venturing to prophesy, that I trust succeeding half years will show a diminution under that head, and I congratulate you on this fact, that we show £17,000 better than we did this time last year. You will remember that we had then to come upon the reserve-fund for a considerable sum. In addition to that we have what I trust is not about to become a permanent feature in our accounts, no less a sum than £3000 charged under the head of "Parliamentary and law expenses." Taking these two sums together—the £17,000 and the £3000—it puts us into a position which I cannot help thinking justifies me in hoping well for the next half year. Gentlemen, the main topics upon which I have to address you are with reference to the proceedings of the last parliamentary session. You will remember when the session commenced we had before us two matters. First, and of minor importance, was the Subways Bill. That was a bill which had been originally introduced into the House of Commons in 1867, where it passed through its several stages, but was never introduced into the House of Lords at all. Last session it was revived in the House of Lords, and taken up in precisely the same state and condition in which it left the House of Commons the previous session. As far as the Imperial Company was concerned, I confess the Subways Bill has always appeared to me as a bill not very likely to affect our interests, because we do not light a district in which it is probable that subways will ever be constructed. The bill was shorn, while in the House of Commons, of some of its most offensive features, one of those features being the power which it gave to the Metropolitan Board of Works at their will to force the gas companies to lay their mains in these subways, and then to charge them a rental for the accommodation equal to 5 per cent. upon the outlay incurred in their construction. This very modest request on their part was rejected by the House of Commons, and as they are now, if they desire it, at their own expense to remove the companies mains into the subways, I do not think they have much encouragement to interfere with them. At all events, as I said, I do not think subways are likely to exist, to any great extent, in the Imperial Company's district. But then we thought it involved a principle, and that it was unfair that, because the bill was not likely to affect our property, we should leave those companies who would be affected by it to bear the whole brunt of the battle. We therefore joined with them in opposing the bill, and taking care as far as we could that the gas interests of the metropolis should suffer no prejudice from it. The main contention last session was as to who should bear the responsibility in the event of any accidents occurring. We said: "You, the Metropolitan Board, think that gas-pipes can be laid in subways without danger; we, on the other hand, think the danger likely to be incurred is very considerable." And allow me to say we were supported in that respect by a most eminent authority—Dr. Letheby—who entertains the strongest possible opinion that to introduce gas-mains into subways is fraught with incalculable danger. We said to the committee: "If the Metropolitan Board think there is no danger, the responsibility which is great in our eyes must be in theirs a mere bagatelle: let them take it upon themselves." The committee of the House of Lords, however, would not listen to that argument; they thought the experiment should be tried; that gas and water pipes should be put into the subways which now exist, and that if any accident arose the question should be decided by a court of law, whether it was caused by the defective mains of the companies, or from the want of ventilation and proper management of the subways themselves, which remain under the jurisdiction of the Board of Works. As I said before, I do not know that the matter is very likely to affect the Imperial Company, as it is not probable that we shall be troubled with subways in our district. The other matter which came before Parliament last session, and which of course was of much more importance than the one I have just alluded to, was the bill of the corporation of the City of London. That was a bill to enable them to supply the City of London with gas, and to trade as a gas company upon corporate funds, in opposition to the private capitals of the various existing companies. In addition to that the Chartered Company had a bill, and the Imperial Company also had a bill, the bill of the Imperial Company being very much a repetition of the bill originated by them in the previous session in 1867. Now, the bill of the corporation of the City of London was introduced at the express invitation of the committee which sat in 1867 upon the metropolis gas question. You will remember—for I dare say you are familiar with their report—that the committee in 1867, presided over by Mr. Cardwell, held that they could not force upon the companies terms different from those on the faith of which they had originally subscribed their capitals; but they said, if the companies came to Parliament themselves to ask for powers to raise fresh capital, or that even if an opposition came from such a body as the corporation, who were to trade, not upon private resources, but upon public funds, it would give them the opportunity of doing by indirect means that which they believed it would be dishonest to attempt by direct means. Gentlemen, I can only say the morality is not mine; and I certainly rejoiced this morning, on reading in the papers that Mr. Cardwell had been delivering a lecture at Oxford upon education, to find that he did not there enforce such questionable ethics as those he enunciated in the committee of the House of Commons. However, that was the upshot of the report of the committee of 1867, which expressly invited the corporation or the Metropolitan Board of Works to introduce competitive bills of the nature I have described. I cannot say that the committee of 1868 can be called a gas inquiry at all; it is an abuse of terms to call it an inquiry. Two of the

members of the committee of 1867—the two, if I may be allowed to say so, who, next to the right honourable chairman, were the most qualified to form a judgment on the merits of the case, retired, and two other gentlemen came in their places. The evidence taken in 1867, as well as the evidence taken before Sir John Trollope's committee, was referred to this committee. Those notes of evidence each represented a good stout volume of about 560 pages, and I should just like any gentleman present to consider the probability of a member of Parliament sitting down and making himself master of the contents of these two books. I happen to know that one of our own counsel—a gentleman who was introduced to the gas question last session—felt it his duty to make himself master of these volumes, and he assures me that he never recollects having to contend with greater difficulties in the whole course of his professional experience than in having to familiarize his mind with the leading principles and facts they contained, and at the same time keep apart and separate masses of evidence which bore so much resemblance to each other in their main features. The gentleman who told me this was as competent as either of the two gentlemen who were added to the Gas Committee last session, and yet we were not a little surprised to hear it stated that these new members were thoroughly conversant with the whole matter, and that the committee of 1868 were prepared to take up the inquiry precisely at the same point at which it was left in 1867, and prepared, therefore, to adopt the report which invited the corporation and the Metropolitan Board to introduce a bill and establish gas-works out of public funds in competition with the private capital of the gas companies. The corporation of London proceeded to give their evidence, and perhaps it may be fairly said that I am not a competent person to assert whether that evidence was or was not sufficient to justify the passing of their bill; but I must say that in my experience more meagre evidence I never heard, and I also say this, that the estimates put forth for the construction of their works were simply absurd. I was much struck, however, with this fact, that one of the most active persons who in previous sessions gave evidence against the metropolitan gas companies—Mr. Hughes—was on this occasion conspicuous by his absence. I should like to know whether or not it is a fact that Mr. Hughes considered the estimates relied upon were so preposterously unfair that he declined to give evidence before the committee this session. If so, I think it is as much to his credit as it is to the discredit of those who put forward evidence which their own witnesses tell them is unfair and untruthful. Well, gentlemen, the inquiry took place, and I do not think it much mattered what the corporation proved, for the committee evidently intended from the first to pass their bill, or, at all events, to threaten the passing of it, so as to coerce the companies into terms. I can hardly suppose that they would have passed the bill in the shape in which it was presented, for, amongst other things, it did not contain any provision for a compulsory supply of gas by the corporation to any person requiring it; but certain it is that they said they were prepared to pass it. Then came the bill of the Chartered Gas Company. The Chartered Company, of course, understand their own affairs best; and what might have been the case had that company remained firm, and refused the conditions insisted on by the committee, I cannot say. The Chartered Company, however, said it was to them a matter of life or death, and their chairman came forward in the committee, and, in accepting the conditions, stated in effect, "We believe it will be ruinous to us, at least for some years to come, but we must hope for better things." The committee then proceeded to go through the Chartered Bill, and that company accepted all the terms which the committee imposed upon them. Next came the bill of the Imperial Company, and it did so happen that it fell to my lot, in the unavoidable absence of our eminent counsel, to have to state to the committee the position of this company. We, of course, knew the fate impending over us, because we were about to reject the terms which the chairman laid down as the *sine quâ non* of passing either of the bills. "Do you mean to accept the terms?" said the chairman. "No, we do not," I said; and I pointed out that we could not, in justice to our shareholders, accept terms which, considering the additional illuminating power of the gas and the decreased price to be charged, would deprive us of an available profit to the amount of £70,000 a year. I said that we did not feel we should be justified in making so large a sacrifice of the shareholders property, and therefore must refuse. But I added, that inasmuch as there were two new members on the committee who did not know the circumstances of the case, I should like to point out the position of the Imperial Company, and show the injustice of attempting to impose upon us additional terms to those upon which we subscribed our capital, and to do it upon the allegation that we had gone to Parliament to ask a boon or favour. "We come here," I said, "to ask no boon or favour: we come here solely to ask for power to comply with the conditions already laid upon us by the Act of 1860. By that Act, Parliament insists that we shall light a certain district, and they gave to private individuals as well as public bodies the right to insist upon a supply of gas from us. But we have not capital sufficient to do it, and all we ask is, that you will authorize our raising the money we require. We do not ask it as a boon, for we tell you fearlessly that, instead of raising capital to fill up our district at a rate which is not remunerative, we should prefer remaining as we are." I said: "We stand in a totally different position to a company—say, for instance, the Midland Railway Company, which is coming up from Luton to the Euston Road. They come and ask a favour at the hands of Parliament—viz., the privilege of continuing their railway up to a terminus in London. Parliament may very well say to them—'It is but reasonable that, if you ask a favour of us, we should be at liberty to alter your position, and put upon you some additional restrictions.' But our position is totally different: we do not ask any favour—we only ask the power to fulfil those obligations you have yourselves imposed upon us; and, if you are not willing to give us that on the old terms of 10 per cent., then leave us as we are—we are content." Well, gentlemen, the result was that our bill was refused. With the Chartered in a short time went the other two City companies; because it was quite impossible that the Great Central and the City Companies should hold out if the Chartered succumbed, and accepted the terms. But, in justice to those companies, we must bear in mind that they stood in a different position to us. There was no bill by the Metropolitan Board, threatening to come into competition with us; and therefore we knew that, if we said simply, "We refuse your terms," the committee, who said they could not force terms upon us, could not do anything *in invitas* under those circumstances. But that was not the case with the City companies; and, though I differ with them, and doubt whether their conduct was as bold as it ought to have been, and whether it was the best for their own interests, still, as I say, they stood in a different position to ourselves, and might, as it appeared to them, have placed themselves in peril if they had refused the terms which the Imperial Company rejected. I think it is but fair to them to say that. But I happened just now to run my eye over the report of the directors of the Chartered Gas Company, presented to their shareholders the other day, and I fancy I detected in it a little bitterness of tone. They seem to complain of the other companies for opposing them in Parliament. I hope I am mistaken in thinking there is any bitterness of tone; but if there is any, I can only say that it will find no response at this board. The Chartered Company came with their own bill, in the preamble of which they stated, what at least appeared rather cool—something to the effect that it was most undesirable for gas-works to continue to exist in London, where they were ill-ventilated and generally in a bad condition. We said at once: "Say this if you like of your own company; we assure you we have not the slightest wish to dictate how you shall characterize yourselves. You are the best judges, and very likely your works are in the condition you describe; but you must not say the same about our works at Fulham, or at St. Pancras, or Shoreditch, which are in such a condition that we are not ashamed for any one to see them." They said: "This is only a private bill, and what we say we say of our own works." Well, the chairman of the committee said: "If that is the case, say so plainly." I could not help thinking that, if that phraseology had been allowed to remain, in two or three years time it would have been said that there was a parliamentary declaration in the Chartered Gas Act, 1868, which shows that the Legislature at that time considered every gas company ought to be turned out of the metropolitan area. This was pointed out to them, and whether they meant what we thought they did, or whether they confined the observation to themselves, I can't say, but in the result it was made to extend to them alone. I think it was not very unreasonable that we, seeing such a clause in their bill, should appear to look after our own interests. But we behaved generously in this way: we did not oppose them in the House of Commons, because we thought some of these allegations would assume another form. It was only when we found they were going on to pass the bill with this general phraseology that we appeared, and offered, not an ungenerous opposition, but such as we thought we were justified in doing. The bill has now passed, and the result is that from the beginning of January, 1870, they are required to supply 16-candle gas at 3s. 9d. It is an experiment certainly, and I only hope that the chairman of the Chartered Company, when he addressed the committee, took too lugubrious a view of its effects when he said it would be ruinous to them. I hope it may turn out the contrary, and I hope it for this reason, that if the Chartered Company can stand it we can stand it. Our interest is to supply good gas, and to supply it at as cheap a rate as possible. The Chartered Company also, in their report, say this: that they have only accepted in 1868 what all the other companies were willing to accept in 1867. Now, I wish to say, and I say it with all possible good nature, that they have allowed a playful imagination to deal peculiarly with facts—I put it in the gentlest possible way. They should rather recollect that in 1868 they actually accepted, or rather conceded, the very point that we considered all important in 1867. They have given up the power to make up deficiencies in the back dividends even of a single year—a point which we all, including the Chartered Company, regarded as so important in 1867 that we would not agree to it. Having swallowed that difficulty, they ought not to say they have accepted substantially the terms which we were willing to accept in 1867; and they ought to bear in mind that, considering the position they were in, the other companies were justified in the kind of opposition they offered to their bill—that is, in holding a watching brief, so as to be able to take care that while the Chartered Company consulted their own interests ours were not interfered with. I avoid altogether speculating on the next session and what it may produce. We must take care and watch our interests, and do the best we can for ourselves. I think it far better not to offer any speculations which might be made use of elsewhere; and therefore, gentlemen, I believe I have no further observations to make, either upon the report and accounts of the Imperial Company or of the proceedings in Parliament, which have given us, I confess, a good deal of anxiety. One subject, however, remains, which is very briefly alluded to in the report, and that is the retirement of our friend, Mr. St. George Burke. That gentleman sits amongst you to-day, and therefore I am constrained in saying much about him. He is an old personal friend of mine, and a gentleman who sat at this board for many years. But he has now resigned. His reasons for resigning were shadowed forth in the last report, in which we stated that his son having been elected a director, Mr. Burke himself meant to retire from the board. He has now sent in his resignation, and after for many years sitting on this side of the table, where I, for one, regarded him as a most kindly and efficient colleague, he now takes his place in the general body of proprietors, among whom he holds no inconsiderable a share of interest in the company. I can only say we part from him with great regret; he has been with us for many years, and I am quite sure I shall have the support of my colleagues when I say his assistance has been at all times most valuable, and his professional knowledge has been of the greatest benefit to the company. Now, gentlemen, having made these remaks, I beg, in conclusion, to say that I shall be extremely happy to answer to the best of my ability any questions which the shareholders put to me, and having done that, will formally propose—"That the report now read be received and entered on the minutes."

Mr. CHRISTIE seconded the motion.

Mr. LOW WHEELER: In the interests of the company, as well as for myself, I think it behoves me to say a few words with reference to the remarks which have just fallen from the governor. We live in troublous times, and in such a sea of storms it becomes us to keep everything in the ship as right and tight as we can; that seems to be the last occasion that we ought to part with one of our most valuable officers. Every gentleman present must have seen and admired the manner in which Mr. Burke conducted the affairs of this company for several years. He was the predecessor of our excellent and respected governor, and as a director I am sure there could be no difference of opinion respecting him. I feel confident that on the present occasion I shall enlist the general sympathy of the meeting in proposing that we ask Mr. St. George Burke to reconsider his resignation. It is of the greatest importance that in existing circumstances everything should be kept in order, and I confess to great pain in seeing something so much out of order as Mr. Burke on the wrong side of the table. It rests with you, gentlemen, to put him on the right side again. The last thing in the world we ought to give way to in this matter is the point of etiquette which induced that gentleman to retire on the election of his son. I therefore propose—"That the resignation of Mr. St. George Burke be not accepted, and that he be entreated to remain in the position which he occupied so long to his own honour and credit and to our benefit."

Mr. RHODES seconded the motion.

The GOVERNOR: Gentlemen, I do not know that it requires me to make any observations. I have already intimated to you what I believe to be the feeling influencing Mr. Burke's mind, but he is here to speak for himself,

and I have no doubt he will correct me if I am out of order. It is now proposed that his resignation be not accepted, and that he be requested to reconsider his determination. I think, in strict form, Mr. Burke having resigned, the motion should take this form—"That Mr. Burke be requested to reconsider his determination, and that the directors be requested to re-elect him;" because a gentleman having resigned can hardly recall that step. Of course, the intimation of the feeling of the proprietors will be received with great respect by us.

Some conversation ensued as to the form of the motion, and it was ultimately proposed—"That this meeting hears with regret that Mr. Burke proposes to retire from the board, and, in requesting him to reconsider that proposal, suggest to the board of directors that Mr. Burke's re-election would be agreeable to the shareholders."

Mr. Downs: May I ask whether it will be necessary for you to go to Parliament next session or not?

The Governor: That is, whether we shall initiate any bill ourselves?

Mr. Downs: Yes. I think it is exceedingly desirable, if we can do without, that we should avoid going to Parliament until the experiment with regard to the City companies has been tried.

The Governor: The absolute necessities of the company, unfortunately, require that we should appear before Parliament. We do not want to go there, for the instant we are there we place ourselves in the position which Mr. Cardwell declared gave them the opportunity of imposing new terms upon us; but, unfortunately, we must ask for more capital.

Mr. Downs: The object I have is merely to ascertain whether the absolute necessities of the company would require it to be done. I gather from what you say that it is necessary.

A Proprietor called attention to the fact that the motion for the adoption of the report had not been carried.

The question was therefore put, and the resolution unanimously adopted.

The resolution requesting Mr. Burke to resume his seat at the board was also put, and carried unanimously, amidst cheers.

Mr. Burke: Gentlemen, the passing of that resolution necessitates some observations on my part. I am extremely sensible of the very flattering terms in which this proposal has been made to the meeting, but I think it right that the shareholders, before they come to a decision on this matter, should be placed distinctly in possession of the circumstances under which I have resigned. I am, as Mr. Richards said, with my family, very largely interested in the Imperial Company, and as such I have always thought I had some fair claim to be represented on the board, because, I need hardly say, it is good policy on the part of shareholders to have on the board persons who represent a large personal stake. Self-interest is a ruling principle with most of us, and if a director has a large stake himself in the concern he is pretty sure to look well after it, and his fellow-shareholders participate in his zeal and attention. I was, therefore, probably fairly justified in the course I adopted. But I sat at your board for twenty years and upwards as a director, and during a large portion of that time had the honour of being your governor, and I devoted a considerable amount of attention to your affairs; but twenty years tell upon a man, and I found it desirable, from various circumstances, to retire, not only from professional business, but to retire from London and live in the country. It is utterly impossible, therefore, that I should give that assiduous attention to your affairs now which, under other circumstances, I could have done. Still I thought it fair and reasonable to be represented by a member of my family; and, having a son residing in London and competent to devote himself to your affairs, my co-directors were kind enough to elect him to a seat at the board. But I also thought it fair and reasonable and right, as regards yourselves, that you should have the opportunity, if you thought fit of putting another gentleman from among yourselves in my place, who would be equally competent to attend to your affairs, and who would have more time at his disposal. There is no desire on my part to be represented at the board by myself as well as my son, and therefore I said I should unquestionably resign; but if it is held by the general body of proprietors to be desirable that I should, from my previous experience, retain a seat at the board, my time is certainly so far at your disposal, but with this distinct understanding, on my part, that I am not in a position to devote to your affairs the same attention which a person resident on the spot can do. Of course, whenever required to attend, and in all periods of difficulty, I should, although resident in the country, be prepared to serve the interests of the company. I think it is right you should know this before you finally decide that I should again occupy a seat at the board to the exclusion of some other gentleman who would be equally competent. Having said this, I am entirely at your disposal, and if you think it desirable I should again become a director under the conditions I have mentioned, I am perfectly willing and ready to accede to your wish. But, gentlemen, I tell you candidly that the course pursued during the last two or three years, in reference to the gas companies of the metropolis, has been such as to disgust me. Anything more unfair, anything more dishonest than the policy adopted towards them, by the corporation of London principally, aided by the Metropolitan Board, and finding favour, I am sorry to say, in the House of Commons, I believe never before existed. Imagine, gentlemen, the corporation of London, a set of men composed principally of tradesmen, inducing the Government to introduce a bill enabling them to buy up the works of the companies at such a price as would pay them 6 per cent. for their money, the companies at the time paying 10 per cent. dividend. Imagine them pressing upon Parliament that competition among the companies involved great waste of capital, they having been themselves parties to the promotion of competition, and then urging Parliament to declare that our capital, fairly raised under the authority of Parliament, whether for purposes of competition or not, should be diminished by 40 per cent. But this is all on evidence—evidence of their own. In addition to that, they go still further, and ask, at the hands of Parliament, that their bill should be passed, enabling them to enter into competition with the companies, thereby ruining them at the same time that they take compulsory powers enabling them to buy up the companies when they are ruined. Anything more disgraceful is hardly conceivable in my judgment. I know perfectly well that this scheme of theirs does not meet favour with some of the leading members of the corporation—they take the same view of it that I have expressed; but we know there are agitators in these public bodies who by constant agitation generally manage to carry the day. Well, gentlemen, committees of the House of Commons are not always the same. In 1866, when the attempt by the corporation was made, it was unanimously rejected by the committee presided over by Sir John Trollope; and they not only rejected the bill, but suggested terms, which we were willing to accept—viz., to sell our gas at a reduced price, and of higher illuminating power. They heard the evidence then given, and upon our expressing willingness to accept the terms, the Corporation Bill was rejected, and the committee was dissolved. Why are we to assume that Mr. Cardwell is to rule Parliament? We have one decision of a committee in our favour, but, for what reason I will not attempt to settle, it was considered by Mr. Cardwell that the policy regarded as fair by that committee should be departed from the next session. Why? It is admitted that by direct legislation they cannot interfere with the conditions upon which our existing capitals were subscribed, yet, nevertheless, they would coerce us into terms which would be ruinous to us by the threat that, if we do not accept them, other parties shall be authorized to establish works in competition with us, and that, when we come to Parliament for power to fulfil obligations which Parliament has already imposed upon us, those powers shall be refused us, and that we shall be subject to all the penalties for non-fulfilment of our obligations unless we accept these onerous terms. I have all along contended that it was most desirable to fight this question to the last—that if beaten in committee, we should fight it in the House of Commons; and that if beaten there, we should take the opinion of another tribunal. Why? Because I believe we have a case of plain justice on our side. Observe the policy pursued by Parliament with reference to the telegraph companies. Why should we be dealt with differently? If they say that gas can be supplied cheaper than we supply it, why, in the name of justice, let them buy our undertakings at a fair price—not at a price based upon a 6 per cent. dividend instead of 10 per cent., but upon such a price as represents the real value of our works and business. You, sir, have been asked whether it is necessary for our company to go to Parliament next session or not. Whether it will be necessary for you to go next year or not I must leave to you to reply, but my own impression is the time will soon come when you must have more capital and must increase your works, for you cannot go on as you are now. It was only in the year 1860, when the Metropolis Gas Act was passed, that an obligation was imposed upon us, under penalties, to supply all persons in our district requiring gas. We desire to fulfil that obligation, but we cannot do it; we shall, therefore, be subject to penalties. And that is the principle which Mr. Cardwell says is sufficient to justify Parliament in imposing new restrictions upon us. Now, I believe it will be essential to go to Parliament, and I do sincerely hope when we do go that we shall stand upon our own hook, and not be encumbered by chartered companies in such a state of weakness that they are obliged to yield to every obligation sought to be imposed upon them. We have a past career that we can rely upon, and we have no fear that any investigation which Parliament may make of our affairs will exhibit anything but what has been fair and liberal towards the public. We have challenged that inquiry. We say now as we said before Mr. Cardwell's committee: "Do not take the opinion of empirics from the country as to what gas can be supplied for in London. Investigate our accounts; send to our works, and see whether any better mode of making gas than we have employed can be adopted. We have nothing to concede; we will submit our works to the examination of any one competent to judge, and our accounts to any auditor you may appoint." Well, then, if we have such a case as that, I say it is our best policy to exhibit it to Parliament, and never to yield a principle to conciliate any committee. If the Board of Works choose to bring in a bill to enable them to establish gas-works—and I wish them joy if they make the attempt—let Mr. Cardwell and his committee pass their bill, and we will fight it in the House of Commons to the last moment, and see whether the Legislature will recognize such a principle as it involves. I say, as a practitioner before Parliament for thirty years, Parliament never yet did so. It has been tried more than once, and there is not a single instance on record in which a corporation has sought to supply gas or water, at the risk of the ratepayers, in competition with private companies, but the scheme has been rejected. And why are we to assume that now Mr. Cardwell, by his dicta, is to govern Parliament? My own opinion, from the beginning of that inquiry, was that there was a predetermination to introduce cannel gas into London. Why or wherefore, I will not pretend to inquire, but now we are to have 16-candle gas in the City instead of 14. If 16-candle gas is to be supplied in London—it is admitted by the evidence given before that committee that every candle above 12 is equal to an additional cost of 2½d. per 1000 cubic feet—I say if that is the case the public will have to pay for it, if justice is to be done to the companies and they are to have their dividends. But what evidence is there that the public want it, and are willing to pay that additional sum? From such inquiries as I have been able to make, I believe that, if you were to canvass the consumers of London, the great bulk of them would tell you distinctly that they would rather remain with common coal gas as now supplied than they would have a superior gas and pay a higher price for it. And why? Because we know a large portion of the gas consumed is not consumed for illumination—it is used for heating and other purposes; and if you employ cannel gas for such purposes it is so much waste. But upon the mere dicta of two or three people who go before the committee—although we show that cannel gas cannot be supplied except we put ourselves at the mercy of the cannel coal owners—we are called upon to supply it to our consumers. I am confident that, if the metropolis were canvassed, it would be found that the consumers do not desire it. By adopting the policy of the Act of 1860, and making it obligatory upon the companies to supply gas of such an illuminating power as can be furnished by the great coal-fields in the north, we had always the certainty of being able to buy coals at the cheapest rate; but, if you make it obligatory upon them to employ a coal of which the quantity is limited and the supply entirely in the hands of a few proprietors, the cost of manufacture must be always indefinite, and the only benefit to be derived from the passing of a bill of that kind will be the benefit of the cannel coal owners. Unfortunately, concession has heretofore been the order of the day, although as yet this company have been left scathless. The Chartered Company appear to me to go out of their way when they state in their report that the precedent set in the case of the City companies will be made to extend to the other metropolitan companies. But I tell you firmly that, in my opinion, if we stick to our colours boldly, and fight the question out, whether with the Metropolitan Board or any other body, so long as we have justice on our side there is a fair and reasonable hope of our winning, and that we should be left under the conditions upon the faith of which we originally subscribed our money.

On the motion of the Chairman, seconded by Mr. Christie, a resolution was passed declaring the dividends recommended in the report.

Mr. Low Wheeler moved a vote of thanks to the governor and board of directors for their attention to the affairs of the company during the half year.

Mr. Pilleau seconded the motion, and expressed a hope that the addresses of the governor and Mr. St. George Burke would appear in print.

The motion was very cordially adopted.

The Governor: Gentlemen, on behalf of my brother directors and myself, I beg to thank you for this acknowledgment of our services. We have endeavoured to do our best for your interest, and it is very satisfying to find that our exertions are appreciated by you.

The proceedings then terminated.

SURREY CONSUMERS GAS COMPANY.

The Half-Yearly General Meeting of Shareholders was held at the Bridge House Hotel, Southwark, on Thursday, Oct. 8—THOS. POCOCK, Esq., in the chair.

The SECRETARY (Mr. Boddy) having read the advertisement convening the meeting, the register of shareholders was sealed, and the minutes of the last meeting read and approved.

The following report and accounts were then presented:—

The balance-sheet and revenue account for the half year ending the 30th of June last are herewith submitted. The net profit, including a balance brought from the previous half year, amounts to £10,684 7s. 6d. Out of this sum the directors recommend a dividend of 5 per cent. for the half year, after payment of which there will remain a balance of £184 7s. 6d. to be carried to the credit of next account.

Dr. *Balance-Sheet, to June 30, 1868.* *Cr.*

To Capital—				By Works, as per last balance-sheet	£261,563 14 2
Old shares	£150,000 0 0			Amount expended this half year	968 6 5
New ditto	60,000 0 0				£262,532 0 7
		£210,000 0 0		Due to the company for—	
Bonds		51,360 0 0		Gas	12,527 12 9
Sundry creditors		14,586 13 6		Products	1,362 0 1
Dividends unpaid		234 10 4		Sundries	559 14 7
Revenue account		10,684 7 6		Coals in stock	1,999 10 0
				Cash balances—	
				At bankers, general account	£7,621 4 8
				Dividend account	234 10 4
				Petty cash in hand	28 18 4
					7,884 13 4
		£286,865 11 4			£286,865 11 4

Dr. *Revenue Account, for the Six Months ending June 30, 1868.* *Cr.*

RECEIPTS.				EXPENDITURE.			
Balance brought forward		£ 492 0 11		Directors allowances	£750 0 0		
Sale of gas—				Salaries of secretary and clerks	562 0 0		
Common gas, at 4s. per 1000 cubic feet	£23,997 16 7			Collectors commission and pay	349 13 11		
Public lighting and contracts	6,398 15 4			Stationery, printing, and general charges	399 7 6		
		30,396 11 11		Payment to auditors	31 10 0		
Sale of residual products—						£2,092 11 5	
Coke	£6,410 5 2			Manufacture of gas—			
Breeze	191 11 6			Coals carbonized	£15,659 1 7		
Tar	1,074 17 2			Purifying materials	166 0 4		
Liquor	317 19 2			Supervision and labour	4,948 12 2		
		7,994 13 0		Tools and implements	145 8 2		
Transfer fees		4 10 0		Ordinary repair and maintenance of premises and plant	1,346 2 7		
Miscellaneous receipts		35 9 4				22,265 4 10	
				Distribution, including service-mains, pipes, &c.—			
				Ordinary repair and maintenance	£414 0 4		
				Meters, restoring and replacing	169 1 1		
						583 1 5	
				Rents, rates, and taxes		1,347 6 4	
				Parliamentary charges (on account)		250 0 0	
				Interest on bonds		1,304 9 9	
				Discounts	£105 1 2		
				Bad debts	291 2 9		
						396 3 11	
				Balance		10,684 7 6	
		£38,923 5 2				£38,923 5 2	

The CHAIRMAN, in moving the adoption of the report, said it would be seen at once that there was very little left for him to talk about. The main feature in it was the reference to the gas legislation of the past session. That legislation, which it was admitted was experimental, affected only the companies supplying the City; and he hoped that, before any renewed agitation took place, sufficient time would be afforded to prove its results. One thing in regard to it was very satisfactory—viz., that the new Act recognized the rights conferred upon gas companies by the Metropolis Gas Act of 1860, and the Gas Clauses Act, 1847, to the maximum dividend of 10 per cent. He, for one, had always expressed the confidence which he still retained, that the Legislature of this country would never do a substantial act of injustice to any company or body of men. Although the corporation of London had been able to obtain terms from the City companies, it seemed that one gentleman, who had made himself conspicuous in the late agitation, was still left in a state of dissatisfaction. This gentleman was Mr. Dresser Rogers, whose wrath had been kindled at the appointment of gas referees by the Board of Trade. Probably Mr. Dresser Rogers fancied he ought to have been called into the councils of the board, or perhaps he thought he might himself have been a suitable referee—at a good salary. However that might be, he had been writing to the papers and making a speech in the Common Council to express his disapproval of the course which had been taken by the Government in the matter. The chairman concluded by expressing his hope and confidence that, if the companies generally were unmolested in their operations, the time would come when, with proper regard to the interests of their shareholders, they would be able to supply the public with gas of a higher illuminating power and at a lower price.

Mr. BRUSHFIELD seconded the motion, and said he considered there was much prudence in the suggestion of the chairman that the companies should be left in peace until the experiment in the City had been fairly tried. For after all this was not a question affecting the suppliers of gas alone; the consumers were equally interested. So long as the companies were compelled to spend large sums of money in defence of their interests, so long must the hope of a reduction in the price of gas be deferred. He thought they might congratulate themselves on the fact that the Act of last session recognized their right to 10 per cent., and provided a machinery by which, in the event of the price therein prescribed failing to yield that return, a periodical revision should take place, and a higher price be fixed. He thought the prospects of the companies were now better than they had been for some time past, and that there was some hope of seeing the question finally settled on a just and equitable basis. With reference to Mr. Dresser Rogers, it was hardly to be wondered at that he was still dissatisfied; some persons never were content, but Mr. Dresser Rogers was a very ill-used man, and had a right to complain, for he had for years been striving to put himself or some one else in a good situation, but all his efforts in that direction had been unavailing.

Mr. LIDDLE congratulated the meeting on the satisfactory character of the report laid before them. He was happy to find that the directors for two consecutive half years had been able to recommend a 10 per cent. dividend, and also that the residual products from the manufacture of gas had yielded so large an amount as was shown by the accounts. For these results he felt sure the company were largely indebted to the ability and vigilance of their excellent engineer, Mr. Finlay. He wished to know whether the company had borrowed money to the extent of their powers.

The CHAIRMAN said they had not quite reached the limit; they could raise £4000 or £5000 more.

Mr. LIDDLE thought that, instead of borrowing money from persons outside the company, it might be raised from among the shareholders, and be subject to any calls hereafter to be made.

The CHAIRMAN said the directors endeavoured to get money at the lowest possible rate, and had had offers of plenty at 4½ per cent.

Mr. LIDDLE thought that shareholders who had calls to pay would lend money at that rate if they could legally do so.

Mr. JAMES said there was no legal objection to borrowing money from the shareholders.

Mr. NICHOLSON explained the position of the company in reference to borrowed money, and said the objection to Mr. Liddle's plan was that when shareholders once invested their money they could not withdraw it. The directors endeavoured to get money at the lowest rate, and they did not intend to let the shareholders have a preference with regard to interest.

Dr. EVANS said Mr. Liddle was desirous that the shareholders should have an interest in the whole of the capital. According to the balance-sheet, £261,000 was necessary for carrying on the concern. He thought the company might have two kinds of capital, like the Phœnix Company.

Mr. NICHOLSON: We have no authority for that purpose. We have only authority to create £250,000 of share capital, the rest must be in debentures.

The CHAIRMAN, in answer to a shareholder, said the amount charged in the accounts under the head of "Parliamentary expenses," was an estimate of the contribution of this company to the general expenses incurred by the metropolitan companies, the bill for which had not been sent in. It was a matter of great regret that during the last two sessions the companies had been obliged to spend £60,000 in defence of their position, the whole of which was sheer waste; but the necessity had been imposed upon them.

The motion was then put, and carried unanimously.

On the motion of the CHAIRMAN, seconded by Mr. LIDDLE, the dividend recommended in the report was declared; and on the motion of Dr. EVANS, seconded by Mr. FRANKLIN, a cordial vote of thanks was given to the chairman and directors.

The CHAIRMAN acknowledged the vote for himself and colleagues, and took occasion to speak in terms of high commendation of the services rendered to the company by the engineer, Mr. Finlay, to whom and to the secretary, Mr. Boddy, he moved a vote of thanks.

Mr. FRANKLIN seconded the motion, and said he was satisfied, from the results laid before the meeting, that both these gentlemen were thoroughly indefatigable in the discharge of their duties.

Mr. NICHOLSON: And no two men can be more thoroughly independent.

Mr. BRUSHFIELD: I know Mr. Finlay is, for he came out of our school (the Commercial Company).

The motion was very heartily and unanimously responded to.

Mr. FINLAY: Gentlemen, I beg to thank you very sincerely for this renewed expression of your confidence, and I beg to thank Mr. Brushfield for the kind manner in which he has spoken of me. I was, as he says, in his school about ten years, and from his remarks I have the satisfaction to think he takes credit for turning out a good pupil. I can only say my heart is in the work, and I have always felt a great interest in the progress of the company.

Mr. BODDY: On my part I thank you, gentlemen, for the vote just passed. I can only say I have endeavoured to deserve your approval, and shall continue to do so.

ON REVERSE CHEMICAL ACTION.

By WILLIAM ODLING, Esq., M.B., F.R.S.,
Fullerian Professor of Chemistry at the Royal Institution.

[A Lecture delivered at Norwich, Aug. 25, 1868, to the British Association.]

A weight, let go from the ceiling of the room, very quickly falls to the bottom, where its motion is arrested by the floor. At whatever height above the floor the weight may be suspended, it does not require any urging—any propulsion—in order to reach the floor. All that is necessary is for it to be let go—to have its means of support removed—and it falls of itself. It has, apparently, an innate tendency to fall, and it manifests that tendency directly the opportunity is afforded it.

Once in contact with the floor, however, it remains there. It has no innate tendency to rise again to the ceiling. For it to get back to the ceiling, it must be lifted up by the effort of some one or other—by the exercise of some amount of power or force—just as the weight of a clock must be wound up by some one or other, while it runs down of itself.

Viewed as a system of bodies, there is between the raised weight and the floor a certain capability or potentiality of falling together; while between the fallen weight and the floor there is no such potentiality. The raised weight and the floor constitute an unstable or mobile system, between the components of which approximative motion is possible. The fallen weight and the floor constitute a stable or immobile system, between the components of which the utmost possible approximation has already taken place.

Now, the great majority of the chemical actions to which the attention of chemists has been chiefly directed are comparable with the mechanical act of falling, and with other similar actions in which latent force or potential energy is used or expended. They are, so to speak, instances of running down, and not of winding up. Only let the chemical reagents be situated under conditions in which they can act on each other—only let them be afforded the opportunity of acting on each other—and they do act of themselves, without requiring any external agency or propulsion. By virtue of their innate tendencies, apparently, they form new combinations, which, under the conditions of the experiment, are more stable than the original combinations; and just as, in our mechanical example, the production of a more stable system is attended by and demonstrated by an expenditure of motion, so, in our chemical examples, the production of more stable compounds is attended by and demonstrated by an expenditure of that interstitial motion which we call heat.

Let me further explain my meaning to you by a very simple and well-known experiment. In one of these tubes I have placed a piece of that very active chemical substance, phosphorus, and in the other some iodine, also a body of considerable activity. On bringing the two into contact, they quickly react on each other to produce a third substance, known as iodide of phosphorus, and the reaction is manifested to you by an obvious evolution of light and heat. Just, then, as between the raised weight and the floor there is a potentiality of falling together, so between the phosphorus and the iodine there is a potentiality of burning together; and just as the expenditure of motion in the one case manifests the change from a less stable to a more stable mechanical system, so does the expenditure of heat in the other case manifest the change from a less stable to a more stable chemical system. We begin with the very active bodies, phosphorus and iodine; we end with the comparatively stable and inactive body, iodide of phosphorus, and the change is accompanied by a development of heat.

Let me give you a further illustration. I have here some zinc foil, in contact at first with the oxygen of the air, and, in another minute, with the stream of oxygen issuing from this tube. Now, between the zinc and oxygen, as between the phosphorus and iodine, there is a potentiality of burning together; but as yet they do not burn. For them to burn, I must raise the temperature of one or other of them considerably, even though for an instant only. The combustible, but as yet unburning, zinc may not inaptly be regarded in the light of a raised weight suspended by a thread. On cutting the thread, in the one case, so as to bring about the necessary condition, the weight falls of itself; and on applying the flame of a spirit lamp, in the other case, so as to bring about the necessary condition, the zinc, taking fire in the oxygen, burns of itself with an exceeding brilliancy. To discuss with you the conditions of chemical action would be foreign to my purpose this evening; it must suffice for me to point out to you that the result of the chemical action taking place before your eyes is the conversion of our comparatively unstable zinc and oxygen into the very stable white oxide of zinc which is now floating about the room, and of which the formation was attended with so striking an evolution of light and heat.

These chemical reactions, then, of iodine and phosphorus and of oxygen and zinc, which take place of themselves on the occurrence of suitable conditions, which result in the formation of more stable bodies, and are attended by an evolution or expenditure of heat, we call direct chemical actions; just as we might call the falling of a weight, or what comes to the same thing, the running down of a clock, which similarly takes place of itself on the occurrence of suitable conditions, and is attended by an expenditure of motion, an instance of direct mechanical action.

The conversions we have just considered of the two chemical substances, phosphorus and iodine, into the one chemical substance, iodide of phosphorus, and of the two chemical substances, zinc and oxygen, into the one chemical substance, oxide of zinc, are both instances of that particular kind of chemical action which is known as chemical combination. But it would be a great mistake to confine the notion of direct chemical action to that of chemical combination, since it includes equally well what is known as chemical decomposition. For example, upon this piece of folded filtering paper there is placed a small quantity of iodide of nitrogen, a substance analogous in composition, though very dissimilar in properties, to the iodide of phosphorus we produced a few moments ago; for whereas iodine and phosphorus have a tendency to combine with each other, the already combined iodine and nitrogen of this body have a tendency to separate from each other, so that upon touching the body even with a feather it undergoes, as you perceive, an explosive decomposition into its constituents, the decomposition being attended by an evolution of light and heat. Comparing the two experiments, in one of them we begin with the unstable constituents, phosphorus and iodine, and end with the comparatively stable compound, iodide of phosphorus. In the other we begin with the very unstable compound, iodide of nitrogen, and end with the comparatively stable constituents, nitrogen and iodine; the combination in the one instance and the decomposition in the other being alike attended by an expenditure of heat.

As a converse experiment to the combination of zinc and oxygen, which took place only upon the momentary application of flame, I may call your attention to the decomposition of gun-cotton, also brought about by the momentary application of flame. Quite irrespective of air or oxygen, the bulky mass of gun-cotton, when touched by a lighted taper, at once breaks up into a complex mixture of invisible gases; and the breaking up of the gun-cotton, like the building up of the zinc-oxide, is attended, you perceive, by an expenditure of heat.

We may easily find a parallel to these chemical decompositions in some mechanical act or other—as, for example, the discharge of an air-gun. Much as the the bullet and stock of the weapon are in a constrained mechanical relation to each other, so are the constituents of such unstable bodies as iodide of nitrogen and gun-cotton in a constrained chemical relation to each other respectively. In each case, however, the establishment of a more stable mechanical or chemical system necessitates a divergence or separation instead of an approximation or combination, as in our previous examples of molar and molecular change. And as between the bullet and air-gun there is a potential motion of divergence, the expenditure of which demonstrates their assumption of a more stable mechanical relation to each other, so between the nitrogen and iodine of the iodide of nitrogen, and so also between the constituents of the gun-cotton, there is a potential heat of decomposition, the expenditure of which demonstrates their respective assumptions of more stable relations to each other. It is the expenditure of heat, then, which forms the criterion of direct chemical action—of the transformation of less stable into more stable bodies—whether the transformation be an instance of combination or decomposition, and whether it take place at once or only upon the occurrence of an elevated temperature. In the dynamics of chemistry we make no distinction between combination and decomposition; we consider only the relative stability of the original and of the resulting bodies; our evidence of the greater stability of the resulting bodies being the expenditure of heat in their formation, and our measure of their stability being the amount of heat expended in their formation.

How, then, can the amount of heat expended in the formation of a body be estimated? How, in general, can different amounts or quantities of heat be balanced against each other? That a mere observation of temperatures, irrespective of the different kinds and quantities of matter manifesting the temperatures, will not afford us the information we require, is easily apparent. I have here a considerable piece of solid brass rod suspended in a beaker of boiling water, and having, accordingly, the temperature of boiling water, or 100° centigrade; and I have here a small platinum ball maintained at a full red heat by the Bunsen gas-flame. That the platinum is very much hotter than the brass, or that the temperature of the platinum is very much higher than that of the brass, is obvious; but which of the two pieces of metal is associated with the largest quantity of heat? I drop the red-hot platinum ball into a glass of water, whereby an equilibrium of temperature between the platinum ball and the water is at once established: but the excess of heat imparted by the platinum to the water is so small that it does not raise the temperature of the water sufficiently for it to affect the rough air-thermometer which I am employing. I now withdraw the small platinum ball, and immerse in its stead the larger, though far less hot, piece of brass rod. Here, also, an equilibrium of temperature between the metal and the water in the glass is soon established, but the excess of heat imparted by the brass rod to the water is sufficient, in this case, so to raise the temperature of the water that, on again introducing our air-thermometer, the coloured liquid in its stem rises in an instant to the very top of the scale; whereby it is made evident to us that the brass, though at a lower temperature than the platinum, has imparted to the water a much greater quantity of heat than did the platinum. This, then, is the principle made use of in the quantitative measurement of heat—namely, the observation of the temperature that any heated body will impart to some given quantity of water. And in order to have a definite standard of comparison, the quantity of heat necessary to raise the temperature of one kilogramme of water 1° Cent. (which is very nearly the same as that required to raise the temperature of 2 lbs. of water 2° Fahr.) is taken as the unit of heat.

By a unit of heat, then, is meant the quantity of heat required to raise the temperature of the water contained in this litre measure from 0° to 1°. Accordingly, all that is necessary, in order to estimate the amount of heat produced by any particular chemical action, is to let that action take place under such circumstances that the whole of the resulting heat shall be taken up by a known quantity of water, and then to notice the rise of temperature undergone by the water. In this little cup, for instance, I have a mixture of that highly oxidized salt, chlorate of potassium, and coal dust, which, on being set fire to, burns, you observe, with a profusion of sparks, much after the fashion of a squib. If I want to know the amount of heat produced by this particular combustion, I place the cupful of mixture in a sort of small diving-bell; and, instead of experimenting in the open air, submerge the diving-bell with its contents, and let the mixture burn under a considerable depth of water in this glass cylinder. The gaseous products of the combustion, in bubbling up through the water, become thoroughly cooled; and, now that the combustion is over, I have only to admit some water to the interior of the diving-bell, agitate the whole for a few seconds, and notice, by means of a thermometer, what increase of temperature the water in the cylinder has experienced, when I learn that the heat of this particular combustion has sufficed to raise the temperature of so much water through so many degrees.

By means of instruments similar to this in principle, but of far greater delicacy and exactitude, the amounts of heat evolved by a considerable number of chemical changes have been ascertained, and the following general result arrived at, namely, that the quantity of heat evolved by any particular chemical action is perfectly definite and substantially invariable. Recalling your attention to our experiment on the combustion of zinc in oxygen, it is found that whenever 65 grammes of zinc combine with 16 grammes of oxygen, to form 81 grammes of oxide of zinc, the heat evolved amounts to 86 units, or is the quantity necessary to raise the temperature of 86 kilogrammes of water 1°. Similarly in the combustion of hydrogen, to which I am now about to direct your attention, whenever 2 grammes of hydrogen combine with 16 grammes of oxygen, to produce 18 grammes of water, there are evolved 68 units of heat. But, although the quantity of heat is substantially invariable, the temperature resulting from any particular chemical change is variable within the widest limits, and is dependent chiefly upon the rapidity of the chemical change, and upon the quantity and kind of matter to which the resulting heat is imparted. Here, for instance, I have a mixture of oxygen and hydrogen gases which, under the influence of a ball of platinized clay, will gradually combine to produce an inappreciable volume of water. The action is now taking place, and the condensation of the mixed gases is manifested to you by the gradual rising up of the mercury in the tube. In this case the rapidity of the combination is so inconsiderable—the amount of oxygen and hydrogen combined within

a given instant is so small—that the dissipation of the resulting heat almost keeps pace with its evolution, so that the temperature of the clay ball never rises to any recognizable extent.

But here I have another arrangement, in which the combination of oxygen and hydrogen gases is taking place more rapidly, though still in a very leisurely fashion, under the influence of a piece of clean platinum foil; and here you perceive that the heat of combination is evolved with sufficient rapidity to maintain the platinum at the temperature of dull redness. That the platinum foil is now tolerably hot is shown by its redness; that it is not extremely hot is shown by its inability to inflame the coal gas with which it is surrounded.

But, if I cause the oxygen and hydrogen gases to enter into combination with great rapidity—if, for instance, I burn them together in the oxyhydrogen blowpipe—I get one of the highest temperatures that is attainable by any chemical means whatever. You observe that a piece of lime held in the flame glows with an intense white light—the so-called oxyhydrogen light; that a slip of that most refractory metal, platinum—at one time thought to be infusible—is melted in an instant; that a piece of stiff sheet iron fuses into holes wherever the flame is directed upon it; and that a button of zinc melts, and even boils, at the temperature to which it is exposed, while its vapour, taking fire, burns in the air with an almost dazzling splendour.

According, then, to the amount of combination effected within a given time, so is the degree of temperature attained, which may vary, as we have just seen, from a scarcely recognizable warmth up to a point at which platinum exists in the liquid state; but whether the combination be effected rapidly or leisurely, whether the resulting temperature be high or low, for every 18 grammes of mixed gas transformed into water, there are just 68 units of heat liberated, neither more nor less.

Now it follows as a matter of reason, and has been proved as a matter of experiment, that in order to undo or reverse any chemical action, exactly so much heat must be supplied from some source or other as was expended in the original action; and, since 68 units of heat are expended in the burning of 2 grammes of hydrogen with 16 grammes of oxygen, the unburning of this quantity of hydrogen—the reversing of the chemical action we have just considered—can only be effected upon the condition of restoring, somehow or other, these 68 units of heat. This unburning of hydrogen is an instance, then, of what is meant by a reverse chemical action. It is a chemical action which does not take place of itself, like the falling of a weight from the ceiling to the floor; but, like the raising of a weight from the floor to the ceiling, it can only be effected by the constraining agency of some extraneous force or power.

If we call the falling of a weight from the ceiling to the floor an instance of direct mechanical action, the raising of a weight from the floor to the ceiling will constitute an instance of reverse mechanical action. Let us, then, consider for a moment the different means by which we may effect this reverse mechanical action. One very ready means that suggests itself consists in the direct action or falling of some other and heavier weight. If, by means of a cord and pulley, I attach our weight to a heavier weight already raised to the ceiling, the falling of the heavier weight will simultaneously effect the raising of the lighter one. A portion of the power of falling which the heavier weight originally possessed will become transferred to the lighter one, and the quantity of its actual falling motion will be diminished by the potential falling motion which will remain in the lighter one.

Similarly, by the burning of a more calorifacient substance, we can effect the unburning of our hydrogen. You will remember that in the combination of 16 grammes of oxygen with zinc there are evolved 86 units of heat, while in the combination of that quantity of oxygen with hydrogen there are evolved only 68 units of heat. Accordingly, if we act upon acidulated water with zinc, we obtain, as is well known, a burning or oxidation of the zinc, and a correlative unburning or deoxidation of the hydrogen; and this burning of zinc at the expense of hydrogen is attended by an evolution of much heat, although of far less heat than would result from its simple combination with oxygen. Just, then, as the power of falling of a heavy weight is greater than the resistance to rising of a lighter one, so is the power of burning of the zinc greater than the resistance to unburning of the hydrogen; and just as the falling motion of the heavy weight is diminished by the potentiality of falling that is transferred to the lighter one, so is the heat of the burning zinc diminished by the potentiality of burning that is transferred to the hydrogen.

Here is our zinc dissolving, and in its midst I have placed the bulb of an air thermometer, whereby you are enabled to see that this burning of zinc at the expense of hydrogen is attended by an obvious evolution of heat; but, since for every 65 grammes of zinc burnt there are 2 grammes of hydrogen unburnt, instead of getting 86 units of heat evolved by the combustion of so much zinc, we get only 86 *minus* 68, or 18 units. The missing 68 units constitute the potential heat of the escaping hydrogen, which I now set fire to; and if the quantity of heat thus evolved by the burning hydrogen be added to the quantity of heat evolved by the dissolving zinc, which is rendered evident to you by the air-thermometer, there will result the very same quantity of heat that might have been evolved by burning this zinc directly in oxygen.

But I may also effect the raising of our weight from the floor to the ceiling by my own muscular effort, instead of by the falling of some heavier weight; and, similarly, I can effect the unburning of hydrogen from oxygen by my own muscular effort, instead of the burning of some more calorifacient element. By merely turning the handle of a suitably arranged system of axle, cord, and pulley, I can lift our weight from the floor to the ceiling; and, by turning the handle of a suitably arranged system of soft iron and copper wire, I can pull apart our oxygen and hydrogen from their state of combination. Availing myself of the electric light, I am able to throw upon the screen before you an image of what is happening in the decomposing cell. You observe that as I turn the handle of the magneto-electric machine more quickly or more slowly—as I employ, that is to say, a greater or less amount of muscular effort—so do I effect the decomposition of a greater or less amount of water, and the liberation of a greater or less amount of oxygen and hydrogen gases at the wire-terminals; and bearing in mind the correlativity of motion with heat, you will readily understand that, in this experiment, the actual motion which might be produced by my muscular effort is diminished by the potentiality of burning, or of quasi-moving, which remains in the pulled-apart gases.

But by far the most remarkable illustration of the unburning of water into its constituent oxygen and hydrogen is that described for the first time some twenty years ago by a recent President of this Association, Mr. Grove, whose experiments, which, in a somewhat modified form, I propose to repeat this evening, established the singular and altogether unexpected fact that upon exposure of the vapour of water to intense heat—by contact with strongly ignited platinum, for instance—a portion of the heated water-vapour undergoes decomposition, with necessary absorption of some of the heat directly supplied. Whether the platinum is ignited by means of a resisted electric current, or of an exposure to the oxyhydrogen flame, does not matter, provided that its temperature is sufficiently raised; but, resorting to the latter means, we have the strange seeming anomaly of the decomposition of water into its constituent gases being effected by the heat resulting from the combination of the constituent gases into water. Now, it does not fall within my purpose this evening to explain to you the ingenious train of thought and experiment by which Mr. Grove was led to this remarkable conclusion, but I think I may venture to repeat here what I had the opportunity of saying some little while ago at the Royal Institution, that none but a very observant man would have noticed the fact at all in the form in which it was originally presented to him, and that none but a very determined and ingenious man would have succeeded in establishing the fact, in front of a by no means carefully concealed scepticism. For the phenomenon, in order to be accepted as a reverse chemical action, had first to effect, as its very difficult task, a reverse chemical notion. It was one of that awkward class of facts which occasionally crop up in different branches of science, and which it seems the bounden duty of every properly constituted mind to deny as long as possible, and then to explain away. But what will happen some day or other to our struggling prehistoric and developmental facts of the present time, has already happened to this twenty-years-old fact of Mr. Grove. Thanks to the thoroughness of its original observation, and thanks again to the skill of its recent investigators, more particularly of Bunsen and Deville, it has grown to be a fact of such goodly and definite proportions, that former sceptics are now magnanimous enough to confess that they admitted it all along; and I dare say the most sceptical of them, that they had long before anticipated it.

Let me direct your attention to the actual experiment, which is now being made upon the table. The flask before you is filled up to its neck with water, which is boiling somewhat briskly, and has been kept boiling for many hours, so as to expel from it, as far as practicable, the dissolved air which it originally contained. From the flask, the steam of this boiling and long boiled water passes next through the coil of platinum tube—just such another coil as that which I have in my hand—and finally escapes at its free extremity; which opens immediately under an inverted narrow cylinder of boiled water standing in a small pneumatic trough. The coil of platinum tube through which our steam is passing, we now heat to a temperature just short of its melting-point in the flame of Deville's oxyhydrogen blowpipe; and, by exposure to this temperature, a portion of the steam within the coil undergoes decomposition. Thence the current of undecomposed steam and of mixed gases resulting from the decomposition of a portion of the steam passes on to the free extremity of the tube, dipping under the inverted cylinder of water. Here the excess of steam becomes condensed, while the incondensable gases, bubbling up through the water, accumulate at the top of the cylinder. Those who are near will see the small bubbles of permanent gas which are now rising briskly through the water to the top of the cylinder; and all, I hope, will be able to see the volume of incondensable gas which will there accumulate, and which we will afterwards explode.

Outside our platinum coil, then, oxygen and hydrogen are being burnt into water, with evolution of heat, while inside our coil, water is being unburnt into oxygen and hydrogen, with absorption of some of the heat evolved by the external combustion; and hereafter, upon exploding the mixed gases, we shall merely get back, as their heat of combination, the external heat that was stored up in them, so to speak, at the moment of their separation.

Similarly, in every other chemical action attended by an evolution of heat—or in every direct chemical action—the heat evolved by the chemical action is nothing else than the particular heat which, directly or indirectly, at some time or other, had been rendered potential in the reacting bodies by virtue of a precedent reverse chemical action, effected by some external force. In other words, every direct chemical action is the consequence of a previous reverse chemical action—is, so to speak, the running down of a weight which had previously been wound up. Contrasting reverse with direct chemical actions, we say that reverse chemical actions are actions which do not take place of themselves, but result from some external force or agency, and are attended by a storing up in the resulting products of the external force employed, or by a conversion of actual into potential energy. On the other hand, direct chemical actions are actions which take place of themselves, not by virtue of some innate tendency of the reagents, but by virtue of some previously acquired external force, and are attended by a liberation of this pent-up force, or by a reconversion of potential into actual energy.

Now, of all the direct chemical actions which are taking place around us, the combustions of food in our bodies and of fuel in our furnaces are by far the most familiar and important. By our consumptions of fuel and food—that is, by their chemical combinations with the oxygen of the atmosphere—we obtain, partly in the form of heat, and partly in the forms of steam power and muscular power respectively, the energy that had been originally rendered potential in some form of growing vegetable tissue and in the correlatively liberated oxygen. We burn together, into carbonic acid and water, the carbohydrogen and oxygen which had been previously unburnt from carbonic acid and water, under the constraining influence of the sun's rays. So that, in consuming coal and wood in our fires or bread and wine in our bodies, we merely liberate the force stored up in the fuel and food, at the period of their formation, by the wondrous reverse chemical influence of the sun; whereby, in the organism of the growing plant, water and carbonic acid have been unburnt into the carbohydrogen of vegetable tissue on the one hand, and oxygen of the air on the other, and whereby just so much solar heat has been absorbed into the products of the unburning as is reproducible in their subsequent burning. When, consequently, in our fires or bodies, the vegetable tissue and oxygen recombine with one another, we really get back the potential heat of the sun's rays, or the mechanical equivalent of that heat, long, long ago stored up in the separated matters.

GAS EXAMINER FOR THE CITY OF LONDON.—Amongst the candidates for the office, just vacated by Dr. Letheby, of gas examiner for the City of London, is Dr. B. H. Paul, for some time principal assistant, in University College laboratories, to Professor Graham, now Master of the Mint. Dr. Paul has long devoted himself to the study and analysis of coal and its various products, and has attained a high reputation in that branch of chemical science. His work on "Technical Analysis" is undoubtedly the most complete in the language.—*Standard.*

DUBLIN WATER SUPPLY.—The Dublin city analyst has reported favourably of the Vartry water, which was extremely unpopular from its dark and highly suspicious colour. His conclusions are that the Vartry water is a perfectly wholesome water, remarkably free from mineral and organic impurities, and admirably adapted for all domestic purposes, and that the deep brown colour and the muddy impurities occasionally met with in the distributory-pipes within the city are not derived from the Vartry or its reservoirs, but are the result of the waters passing through old pipes, which will in course of time be renewed, and the supply made perfect and pure.

TO DETECT THE PRESENCE OF ATMOSPHERIC AIR IN COAL GAS.—Dr. T. Werner, at Breslau, recommends for this purpose the use of the following substances:—Ten parts by weight of anhydrous sulphate of protoxide of manganese are put into a two-necked Woolfe bottle, and then therein dissolved in twenty parts of warm water. To this mixture is immediately added a solution of ten parts by weight of tartrate of potassa and soda (Rochelle salt), dissolved in sixty parts of water. The thorough mixing of the parts is promoted by well shaking the bottle; after this there is added a quantity of a solution of caustic potash, sufficient to render the fluid quite clear. Immediately after this the corks, perforated, of course, and fitted with very tightly fitting glass tubes, are placed in the necks of the bottle, which should be entirely filled with the mixed fluid just alluded to. One of the glass tubes—the inlet-tube for the gas to be tested—should just dip a little under the upper level of the fluid; the outlet-tube, on the other hand, should only reach half way through the perforation of the cork. A very slow current of gas is now made to pass through the fluid, and kept going for at least a quarter, and at most full one hour. In case the gas is quite free from atmospheric air, the fluid in the bottle will remain quite clear; if traces even of air are present, a faint coloration of the liquid will soon become apparent; with a larger proportion of air present in the gas, the fluid will soon be rendered first light-brown coloured, and afterwards intensely black. Since these changes of colour are due to the oxidation of the salt of manganese, it is evident that every care must be taken to avoid the presence or access of accidental air. The fluid in the Woolfe bottle should reach the cork. It is best to cool the bottle during the experiment with ice, if at hand, otherwise with very cold water. The current of gas must be slow.—*Chemical News.*

Share List of Metropolitan Gas Companies.

Number of Shares issued.	Amount per Share.	Name of Company.	Amount paid up p. Share.	Dividend p. Cent. p. Annum.	Price per Share.
	£		£ s. d.	£ s. d.	£
8000	10	Anglo-Romano	10 0 0	10 0 0	11 — 12
5000	20	Bahia (Limited)	20 0 0	3 0 0	14 — 15
1000	20	Do., preference	20 0 0	10 0 0	20 — 22
750	20	Do., do., redeemable	20 0 0	10 0 0	20 — 21
40000	5	Bombay (Limited)	5 0 0	4 10 0	¼ — 4½
10000	5	Do., third issue	4 0 0	4 10 0	3 — 3½
10000	20	British (Limited) (Norwich, Hull-Sculcoates, Hanley, Tunstall & Shelton [Potteries], Trowbridge, & Holywell.)	20 0 0	10 0 0	29½— 30½
12000	50	*Chartered*	50 0 0	7 0 0	56 — 57
6000	50	Do.	45 0 0	7 0 0	49 — 50
10000	20	*City of London*, A shares	20 0 0	9 0 0	25 — 26
10000	10	Do., B shares	10 0 0	4 0 0	6 — 7
9629	10	Do., new shares	10 0 0	9 0 0	12 — 13
25000	25	City of Moscow (Limited)	25 0 0	nil.	5 — 5½
17490	25	*Commercial*	25 0 0	10 0 0	36 — 38
20000	20	Continental Union	20 0 0	4 0 0	17 — 18
10000	20	Do., preference	20 0 0	7 0 0	20 — 20½
5000	10	*Crystal Palace District*	10 0 0	10 0 0	14 — 15
5000	10	Do., preference	10 0 0	6 0 0	12½— 13
10000	10	Do., new shares	2 10 0	7 0 0	2½— 3
4000	50	*Equitable*	50 0 0	10 0 0	69 — 71
4000	25	Do., new shares	25 0 0	10 0 0	34½— 35½
23406	10	European (Limited)	10 0 0	11 0 0	15 — 15½
12000	10	Do., new shares (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	11 0 0	7½— 7¾
20000	10	*Great Central Gas Consumers*	10 0 0	10 0 0	14 — 14½
5000	10	Hong Kong (Limited)	10 0 0	5 0 0	8 — 10
26000	50	*Imperial*	50 0 0	10 0 0	69 — 70
26000	10	Do., new shares	1 0 0	10 0 0	1½— 2
26000	12½	Do., new shares	3 0 0	7 0 0	4½— 4¾
1300	100	Do., bonds	£100	10 0 0	175 —180
28000	50	*Imperial Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwerp, Bordeaux, Brussels, Cologne, Frankfort-on-Maine, Haarlem, Stolberg, Toulouse, & Vienna.)	43 15 0	16 0 0	99¼—100
400	100	Imperial Mexican (Limited)	100 0 0	nil.	
200	100	Do., new	100 0 0	nil.	
3000	40	*Independent*	40 0 0	10 0 0	52 — 53
3000	10	Do.	10 0 0	5 0 0	7 — 9
3000	20	Do.	12 10 0	7 10 0	13 — 14
7133	50	*London*	50 0 0	10 0 0	71 — 73
5610	25	Do., 1st preference	25 0 0	6 0 0	26 — 28
503	50	Do., 2nd preference	50 0 0	6 0 0	
214	50	Do., 3rd preference	50 0 0	6 0 0	
£18781		Do., 1st preference stock		6 0 0	
£11828		Do., 2nd preference stock		5 0 0	
12000	5	Malta and Mediterranean (Limited)	5 0 0	5 0 0	3½— 4
6000	5	Do., preference	5 0 0	7 0 0	.. — 5
30000	5	Oriental (Calcutta)	5 0 0	9 0 0	6⅞— 7¼
30000	5	Do., new shares	1 0 0	9 0 0	1¼— 1⅜
10000	5	Ottoman (Limited)	5 0 0	nil.	1⅞— 2¼
10000	10	Pará (Limited)	10 0 0	6 0 0	8½— 9
27000	20	*Phœnix*	20 0 0	10 0 0	29 — 30
3600	100	Do., new	35 0 0	7 10 0	37 — 38
144000	8k.	Do.	100 0 0	5 0 0	75 — 77
5000	20	*Ratcliff*	20 0 0	10 0 0	25 — 26
	20	Rio de Janeiro (Limited)	20 0 0	10 0 0	23 — 25
6959	5	Singapore (Limited)	5 0 0	4 0 0	
2000	5	Do., preference	5 0 0	7 10 0	
		Shanghai			
4500	50	*South Metropolitan*	50 0 0	10 0 0	73 — 75
	12½	Do., new shares	12 10 0	10 0 0	18 — 19
15000	10	*Surrey Consumers*	10 0 0	10 0 0	13¾— 14¼
10000	10	Do., new	6 0 0	10 0 0	8 — 8½
9000	5	United General (Limerick)	5 0 0		2 — 2¼
10000	10	*Victoria Docks*	5 0 0	6 0 0	
1500	10	*Wandsworth and Putney*	10 0 0	10 0 0	10 — 12
2989	10	Do.	10 0 0	7 10 0	10 — 10¼
316	10	Do.	6 10 0	7 10 0	
1128	10	Do.	3 0 0	7 10 0	
20000	10	Western (Limited) A shares	10 0 0	10 0 0	14 — 15
10000	10	Do., B shares	6 0 0	10 0 0	8 — 9
10000	10	Do., C shares	6 0 0	10 0 0	8 — 9
20000	10	Do., D shares	1 0 0	10 0 0	1½— 2
8000	5	*West Ham*	5 0 0	7 10 0	.. — 7¼
6000	5	Do., new shares	5 0 0	7 10 0	.. — 7¼
551	10	West London Junction (Limited)	10 0 0	6 0 0	
320	10	Do., preference	10 0 0	6 0 0	

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Pig Iron, No. 1 (g.m.b.)	3 12 6	2 12 9	3 3 6	4 5 0	3 10 0
1¼ and 2-inch Socket-pipes	7 10 0	6 0 0	6 15 0	6 15 0	7 10 0
2½ and 3-inch ditto	7 0 0	6 0 0	6 5 0	6 10 0	7 0 0
4 and 5-inch ditto	6 10 0	5 10 0	5 15 0	6 0 0	6 10 0
6 inches and upwards ditto	6 5 0	5 0 0	5 10 0	5 15 0	6 5 0
Retorts, 1st fusion, hot blast	6 0 0	—	5 5 0	5 10 0	6 0 0
Ditto, 2nd ditto, cold ditto	7 0 0	5 15 0	5 15 0	6 0 0	7 0 0
Tank-plates, ¼ thick and above	6 10 0	5 10 0	5 10 0	5 15 0	6 5 0

WROUGHT-IRON TUBING,

Subject to 50 per cent. Discount.

	2 in.	1½ in.	1¼ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 feet—per foot	1 8	1 0	0 10	0 7	0 5	0 4½
Ditto ditto, from 6 inches to 18 inches—each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows (wrought iron)	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, ditto	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 3-quart	15 0	14 0	13 6	13 0	12 0	—

GAS COALS.—*Per Ton.*

Newcastle.—Unscreened:—	
Haswells, Nettlesworth Primrose, and South Pelaw	6s. 6d.
Felling, Framwell Gate, North Pelton, Redheugh Main, Walker's Primrose, West Wear, and Whitwell Primrose	6 9
Burnhope, Craghead, Chariaw, Derwent, East Castle, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside, Lambton's Gas, Lanchester Pelaw, Medomsley, Mickley, New Pelaw, Pelaw Main, Ravensworth, Seaham, South Moor Pelton, South Leverson, Townley Main, Tyne Main, West Pelaw, Wearmouth Hutton, and Witton	7 0
Pearth, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	7 3
Brancepeth, Dean's Primrose, Londonderry Gas, New Pelton, Pelton, South Pearth, Stella, Urpeth, Washington Hutton, and West Leverson	7 6
Ramsay's Newcastle Cannel	15 0
Wigan Cannel (at Liverpool)	17 0
Scotch Cannel:—	
Boghead (at Leith)	42 6
Muirkirk	27 0
Kirkness, best (at Burntisland)	28 6
Capeldrae, 1st quality (at ditto)	28 6
Ditto, 2nd ditto (at ditto)	18 6
Cowdenbeath	12 0
Lesmahago (at Glasgow)	31 6
Ditto (at Granton)	33 6
Arniston	27 6
Wemyss (f.o.b.)	22 6
Haywood, Wilsontown (at Granton)	23 0
Pirnie, or Methill	17 0
Lothian's Cannel (at Leith)	28 0
Myles' Cannel	23 6
Lochore Parrot (at Burntisland)	28 0
Lanemark (at Glasgow)	16 0
Elphinstone Tower (at Leith)	20 0
Coppa Cannel (on railsat Birkenhd.)	14 9
Ditto ditto (ditto at Connah's Quay)	14 3

FREIGHTS.

Coastwise—Newcastle.—Per Ton:—	
Chatham and Rochester	5s. 9d. to 6 0
Cork	8s. to 8 6
Dover, Folkestne, & Ramsgate	6 6
Dublin	8s. 6d. to 9 0
Exeter Quay	7s. 6d. to 8 0
Ipswich	4 6
London (from Leith)	8 0
London (Pool)	6 3
Lowestoft and Yarmouth	4 6
Portsmouth & Southampton	7 6
Plymouth	7 9
Shoreham	6s. 6d. to 7 0
Whitstable	6 0
Weymouth	7s. 6d. to 8 0
Foreign.—Per Keel:—	
Barcelona	£14 10
Bordeaux	13 0
Boulogne and Calais	7 0
Cadiz	15 10
Cronstadt	—
Copenhagen	8 5
Genoa	14 10
Hamburg	9 5
Havre de Grace	9 0
Leghorn	16 10
Lisbon	10 10
Rotterdam	8 7 6
Stettin	9 0
Trieste	14 10
Venice	19 0

SUNDRIES.

Best Nstle. Fire-bks., p. 1000, £2 10s. to	£2 15 0
Cliff's Fire-bks. (at Wortley), p. 1000	2 15 6
Ingham's ditto (at Wortley), p. 1000	2 15 0
Farnley Iron Co.'s Fire-bks. (at Wortley), less discount	2 17 0
Fire-clay Retorts, p. ft. run, 5s. 6d. to	6 7 0
Tough Cake Copper, p. ton	78 0 0
English Pig Lead, p. ton	19 5 0
Welsh Bar Iron (in London), p. ton	6 10 0
Foreign Spelter, p. ton	20 5 0
English Block Tin, p. ton	98 0 0
Banca, p. ton	97 0 0
Tarred Rope Yarn, p. cwt.	1 0 0

C. A. S. VICKARY,

(ADMINISTRATRIX TO THE LATE JOHN VICKARY,)

GAS ENGINEER AND CONTRACTOR, IRON AND BRASS FOUNDER,

EXE ISLAND, EXETER,

Tenders her best thanks to the various Gas Companies in **England, Ireland, and Wales,** for the very liberal and kind support received by her lamented husband for the last **22 years,** during which period he erected and extended more than **200 Gas-Works.** She respectfully solicits a continuation of that support, and begs reference to the following testimonial:—

Plymouth and Stonehouse Gaslight Company.

Sir,—I have much pleasure in testifying that the 100-foot Telescope Gasholder and Cast-Iron Tank, erected by you for this Company in 1862, has given the highest satisfaction, and never required the slightest alteration or adjustment since its completion.

Mr. John Vickary. (Signed) PETER ADAMS, Chairman.

The late Mr. Vickary also erected a 100-foot Gasholder and Cast-Iron Tank at **Exeter;** an 80-foot Telescope Gasholder and Iron Tank at **Devonport;** a 90-foot at **Torquay,** &c., &c. At either of these works satisfactory references can be made.

C. A. S. V. begs particular attention to her **Improved Gas-Meters,** both **Wet and Dry,** the materials and workmanship of which are guaranteed of the very best description, and which have gained for her Meters so excellent a reputation.

RETORTS, DIP & ASCENSION PIPES, HYDRAULIC MAIN, CONDENSERS, PURIFIERS, STATION-METERS, GOVERNORS, VALVES, and GASHOLDERS,

Of any size, and every description of article required in Gas-Works supplied.

Mains, Tees, Connexions, and Syphons, from 2 to 12 in., always in stock, and supplied at Scotch prices.
Clay Retorts and Fire-Goods of every description.
Chandeliers and Gas-Fittings of the most modern designs.
Iron Pipe and Fittings, Service Cocks, &c.

Plans, Specifications, and Estimates for the Erection of New Gas-Works of any size furnished.

WANTED, a re-engagement as FOREMAN in a gas-work. Can fix retorts, lay mains and services, and do general repairs, and can have 16 years character from last situation.
Address W. W., 9, Dagnell Street, St. Alban's, HERTS.

WANTED, a situation as Manager of country gas-works. Can work and set iron or clay retorts, is well acquainted with engine and exhauster, and main and service laying; also with interior fittings.
Address A. THOMAS, Manager, Gas-Works, Ely, CAMBRIDGESHIRE.

TO ENGLISH OR FOREIGN GAS COMPANIES.
A thoroughly competent Engineer, of 20 years practical experience in the construction and management of gas-works, would be happy to hear of an appointment as ENGINEER to works, either in England or abroad (the latter preferred), or to act as Inspecting and Consulting Engineer to a number of works. Testimonials from English and foreign gas companies.
Address GAS ENGINEER, 3, Bishopsgate Street Without, LONDON.

LAMP-POSTS—Plain & Ornamental.
DWARF GAS-PILLAR —Do., do.
LAMP-BRACKETS—Do., do.
LAMPS, in Copper, Tin, and Iron—Do., do.
NUMBERS for STREET-LAMPS.
FOUNTAINS—Garden and Drinking.
VASES—for Gardens, Terraces, &c.
A Book of the newest DESIGNS for these will be forwarded free on receipt of 3s. 6d. in stamps, which will be allowed on first order.

TURNER AND ALLEN,
Founders & Contractors,
201, UPPER THAMES STREET, LONDON.

A Gentleman of high respectability, age 29 years, who has had great experience in analyzing coals and bituminous minerals from various parts of England and the Continent, both for gas and mineral oil purposes, also much practice in erecting experimental and other works, making plans, &c., for foreign companies, desires an appointment, either in England or on the Continent, as Engineer, Manager, or Secretary to a respectable company. Can undertake the erection of works, and draw plans, either to French or English measure. Speaks and corresponds in French, and understands provincial, and little Italian.
Address ENGINEER, 15, Annette Road, Holloway, N., LONDON.

TENDERS required for the erection of GAS-WORKS, in a village 50 miles from London, either separately or for the whole.
Specifications and plans can be obtained of Mr. A. VERRY, St. Margaret's, HERTS, on remitting as follows:—Builder's contract, 21s.; apparatus, 15s.; mains, services, and meters contract, 10s.
The lowest tender not necessarily accepted.

TENDERS wanted for supplying and laying GAS MAINS and SERVICES, in a village 30 miles from London; also for supplying and fixing a quantity of various sized Meters.
Specifications on application to Mr. A. VERRY, St. Margaret's, HERTS.

SWANSEA GASLIGHT COMPANY.
Incorporated 1830—*Re-incorporated* 1861.

NOTICE OF HALF-YEARLY MEETING.

NOTICE is hereby given that the FIFTEENTH HALF-YEARLY ORDINARY MEETING of the Shareholders of the Swansea Gaslight Company will be held at the Office, Works, New Road, Swansea, on MONDAY, the 19th day of October inst., at One o'clock precisely, for the transaction of the following business:—To receive the Report of the Directors and the Accounts for the half year ending the 30th of June last, to declare a Dividend for the same period, and for the transaction of other general business of the Company.
The Transfer Books will be closed on Friday, the 9th day of October, and be re-opened immediately after the meeting.
WILLIAM HENRY MICHAEL, Chairman.
THORNTON ANDREWS, Secretary and Manager.
Swansea, Sept. 25, 1868.

BAHIA GAS COMPANY, LIMITED.
NOTICE is hereby given that the ORDINARY HALF-YEARLY MEETING of this Company will be held at the London Tavern, Bishopsgate Street, London, on TUESDAY, the 27th day of October, 1868, to receive the Report of the Directors, the Balance-Sheet approved by the Auditors, and for general purposes.
The chair will be taken at Two o'clock precisely.
By order of the Board,
Sept. 29, 1868. ARTHUR CLARKE, Secretary.

TO be Disposed of, a set of 4 Purifiers, 5 ft. square by 3 ft. 6 in. deep, with 3 tiers of wood and cast-iron sieves, and covers; 8 5-in. Bryan Donkin's valves, bends and connexions complete. The above only been in use a few years, and removed to make room for larger ones.
Application to be made to the MANAGER, Gas-Works, Tunbridge, KENT.

FOR SALE, at the Lewes Gas-Works, 1 5-in. Station-Governor, 1 6-in. ditto, 8 6-in. Screw-Handle Valves in good order, sundry 6-in. handy connexions for above, 1 set 5-in. Condensers, 13 Pipes, and 1 10-in. Hydraulic Centre-Valve for four purifiers. All in good condition. Replaced by larger.
Apply to the Manager, Mr. W. WRIGHT.

SWANWICK CANNEL COAL. Illuminating power 23·98 candles; yield large, and coke good.
Analyses by W. Valentin, Esq., of the Royal College of Chemistry, London, and William Fiddes, Esq., F.C.S., Gas-Works, Bristol, with price and terms, forwarded on application to H. BOAM, Head Office, 1, Darwin Terrace, DERBY.

NINETEEN YEARS PRACTICAL EXPERIENCE.

EDWIN BENTLEY,
RETORT SETTER,
29, LOWER HOPE STREET, HALIFAX,
YORKSHIRE.
Fire-Clay and Iron Retorts, Double and Single Grooved Brick Retorts, of every description.
Bentley's Improved D Brick Segment Retorts, 5 or 3 in one bed.
Testimonials and references on application.

THE Leek Improvement Commissioners, in the county of Stafford, are prepared to receive designs, specifications, and estimates, with an accompanying tender, for a Single-Lift GAS-HOLDER, 80 ft. in diameter and 20 ft. in depth.
Tenders, &c., to be sent in on or before the 16th of November, 1868, addressed to "Mr. R. Hammond, Clerk to the Commissioners," from whom further particulars may be obtained.
The Commissioners do not bind themselves to accept the lowest or any tender.
By order of the Commissioners,
HACKER & ALLEN, Law Clerks.
Leek, Oct. 7, 1868.

NOTICE OF REMOVAL.

THOMAS GLOVER and CO. beg to inform gas companies and others that they have removed to their new and more commodious premises, 214 to 222, ST. JOHN STREET, CLERKENWELL GREEN (within two minutes' walk of their old premises), where they shall have increased facilities for executing any orders with which they may be favoured.
They take this opportunity of returning thanks for past orders, and to assure them that they shall continue to manufacture their Meters of the best materials and workmanship, thereby maintaining the well-known high character which their Meter has always had.

TO GAS ENGINEERS AND FITTERS.

Every Description of
GAS LANTERNS & REFLECTOR LAMPS
For Shop Windows kept in Stock.
W. DAVIS, 17, Wells Street, Oxford Street, LONDON, W.
Established 1820.

THOMAS CARR & SON,
MANUFACTURERS OF
FIRE-BRICKS, LUMPS, TILES, RETORTS,
&c. &c.
SCOTSWOOD FIRE-BRICK WORKS,
NEAR
BLAYDON-ON-TYNE.

UNIVERSAL PARIS EXHIBITION, 1867.
PRIZE MEDAL in Class 24—Heating and Lighting—for Leoni's Patent Gas-Burners and Gas-Stoves.

LEONI'S Patent Adamas GAS-BURNERS are entirely free from liability to Corrosion, Injury from Heat, or danger of Fraction, and are *unalterable* in the dimensions of their Apertures. Uniformity in the consumption of gas is obtained by the process of manufacture, which insures that the burners shall be precisely similar in pattern.

Net Cash Price, 8s. per gross.
Patentee and Sole Manufacturer, S. LEONI, 34, St. Paul Street, New North Road, LONDON, N.

CANNEL COAL.—The West Yorkshire Iron and Coal Company, Limited, beg to draw the attention of Gas Companies to their Cannel, of which the following is the analysis made by W. Huggon, Esq., F.C.S.:—

Yield of gas per ton	10,296 cubic feet.
Illuminating power rather over	21 sperm candles.
Yield of coke per ton . . .	12 cwt.

The actual working, as reported by one of the largest gas companies in Yorkshire, gives results still more favourable, viz—

Yield of gas.	10,416 cubic feet.
Illuminating power . . .	21·89 sperm candles.
Coke	The same.

We add from the same source the capabilities of the common gas coal—

Yield of gas.	10,080 cubic feet.
Illuminating power . . .	14·41 sperm candles.
Yield of Coke	13 cwt.

COLLIERIES—WEST ARDSLEY, near LEEDS.

For further particulars, address to the Office of the Company, 15, York Place, LEEDS.

ROBERT MACLAREN and CO., EGLINTON FOUNDRY, GLASGOW, Manufacturers of all sizes of Cast-Iron Main Pipes, by an improved Patent. General Ironfounders, Gas Engineers, and Wrought-Iron Tube Makers.

POPE & PEARSON'S GAS COAL. We have now the authority of several of the most eminent Gas Engineers of London in stating that our Coal yields *in practical working over* 10,000 *cubic feet of gas, with an illuminating power of* 16 *candles.*

One ton yields 12½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.

For further particulars, apply to POPE AND PEARSON, West Riding and Silkstone Collieries, near LEEDS.

TO EXPORTERS OF GAS COAL.

THE PATENT GAS COAL yields 13,800 feet of 32-candle gas, saves 33 per cent. in lime purification, and yields a good coke. Shipped, f.o.b., Rotterdam, at 23s. per ton.

Apply to HAMILTON, DULLENS, and Co., DORDRECHT, Patentees for England, France, Holland, Denmark, and Germany; or to their London Agents, WARNER, WALDUCK, and Co., 11, OLD JEWRY CHAMBERS.

OLD WEMYSS CANNEL COAL.—Yield of gas per ton, 12,896 cubic feet; illuminating power, 31·75 standard candles. Port of shipment, Wemyss.

Analysis and price on application to Mr. WM. CAREY, Manager, Wemyss Colliery, Kirkcaldy, FIFE.

CANNEL COAL.

MESSRS. GRIFFITHS BROTHERS, COPPA COLLIERY, MOLD,

Beg leave to call the attention of Gas Companies to the superior quality of their Cannel for gas-making purposes.

This Cannel produces in actual working, in iron retorts, 9200 cubic feet of 32-candle gas, and upwards of 11 cwt. of coke, and in clay retorts will produce 11,500 cubic feet of 25·9-candle gas.

Ports of shipment—Birkenhead or Connah's Quay.

Waggons supplied for delivery by railway to any part of England or Wales.

For particulars, prices, and rates of freight, apply to GRIFFITHS BROTHERS, Coppa Colliery, Mold, FLINTSHIRE.

F. SIMMONDS, Senr.,

221, KINGSLAND ROAD,

RETORT & BOILER SETTER

For the Chartered Gaslight Company, Brick Lane and Curtain Road Stations, and numerous Gaslight Companies, London and Provincial.

NO CONNEXION WITH ANY OTHER RETORT SETTER.

Estimates given with or without materials.

THE GAS-METER COMPANY

(LIMITED), LONDON,

(Successors to CROLL, RAIT, and CO., LONDON, and WEST and GREGSON, OLDHAM.)

MANUFACTURE

STATION-METERS & GOVERNORS

At their Oldham Establishment, which has long possessed the reputation of supplying this description of apparatus of the most perfect construction and appropriate design.

CONSUMERS GAS-METERS IN CAST-IRON & TINNED SHEET-IRON CASES.

STREET GOVERNORS, PRESSURE and EXHAUST REGISTERS, TEST GASHOLDERS,

AND EXPERIMENTAL GAS APPARATUS GENERALLY.

For information, &c., apply to

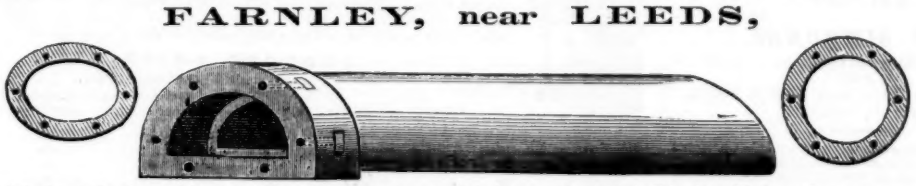
W. ARCHER, Manager, Meter Factory, OLDHAM;

OR TO

GEORGE RAIT, Managing Director, KINGSLAND ROAD, LONDON.

THE FARNLEY IRON COMPANY,

FARNLEY, near LEEDS,



In consequence of the increasing demand for their Retorts, have largely extended this branch of their Fire-Clay Works, and are now prepared to execute the most important orders, either for *home* or *export*, with great punctuality.

The Fire-Clay raised from the Farnley Estate (commonly called the Wortley bed) is unsurpassed by any other known in the district, and is peculiarly well adapted for Retorts, Gas-Ovens, and Fire-Bricks; and the F. I. Co. beg especially to invite those connected with Gas-Works, who have not yet used their Retorts, to be good enough to favour them with a trial.

The F. I. Co. generally hold in stock, for immediate supply, Fire-Bricks of every size and kind—Tiles, Sanitary Tubes, Ornamental Terra-Cotta Ware White Facing Bricks, the White, Buff and Salt-Glazed Bricks, &c., &c.

Prices, Drawings, and all other information may be obtained by applying as above, or to

MR. SUTTON, THE HULL STORES, 46½, QUEEN STREET, HULL.

EDWARD COCKEY & SONS,

IRON-WORKS, FROME SELWOOD,

PATENT GAS-VALVES.

A PRIZE MEDAL

WAS AWARDED TO THE PATENTEES AT THE INTERNATIONAL EXHIBITION OF 1862.

These Valves are formed of two cylinders, working one on the other horizontally, having their faces ground perfectly gas-tight.

They are adapted either as central valves, for two, three, or four purifiers—as bye-passes—or as inlet and outlet-valves for gasholders.

They have been fixed in some of the most important Gas-Works in the Kingdom, for more than eight years. Considerably over two hundred of them are now in use, and the most satisfactory reports of their advantages continue to be received. They are simple in construction, and not liable to get out of repair, and if in course of time the faces should leak, they can be easily re-ground and made as tight as ever, without removal from their positions. Each Valve is fitted with an index, which shows to the person in charge of the Works in what direction the gas is passing.

Frome, January 20, 1866.

CATHELS'S Patent Dry District GOVERNOR is the only perfect self-acting contrivance for regulating the pressures in the higher levels of a district.

CATHELS'S Patent Four-way Disc GAS-VALVE—ONE OF WHICH SERVES AS THREE ORDINARY VALVES—is the best Valve for gas-works.
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CATHELS'S Patent Ribbed Gas Main-PIPES cost but about 1d. to 2d. per yard (depending on the size) more than Plain Pipes, and ensure PERFECT GAS-TIGHT CONNEXIONS with the Service-Pipes.
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TESTIMONIAL.

Abingdon Gaslight and Coke Company, Limited, Offices and Works, Thames Street, June 25, 1868.

Mr. E. S. CATHELS.

Sir,—We have recently relaid a great portion of our town with your Patent Pipe, and I have much pleasure in bearing testimony to its merits. I find from our fitters that there is not the tendency to split when large services are put in that we find in the ordinary pipe of the smaller sizes, and, from having a greater thickness to drill and tap into, there is less liability to leakage at the connexion.

I am, sir, yours respectfully,
JOHN TOMKINS, Chairman.

BIRTLEY IRON WORKS,
CHESTER-LE-STREET,
DURHAM.
Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.
Warehouse in London for Cast-iron Pipes and Connexions of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.
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NATURAL
HYDRATED OXIDE of IRON
constantly on Sale. Apply to
MARTYN DENNIS AND CO.,
LIVERPOOL.

OXIDE OF IRON,
We are prepared to supply, on moderate terms,
HYDRATED PEROXIDE OF IRON (BOG OCHRE),
Same quality as supplied by us to several of the most extensive Gas Companies, and which has given entire satisfaction.
FRANCIS RITCHIE & SONS,
BELFAST.

W. J. SIMMONDS,
Retort and Boiler Setter and Contractor for Gas-Works in general,
7R, SOUTH STREET, NEW NORTH ROAD,
ISLINGTON, LONDON, N.

Upwards of 16 years Retort Setter to the Chartered Gas Company, Brick Lane and Curtain Road Stations.
Materials supplied on reasonable terms if required, or labour only.
No connexion with any other Retort Setter.
N.B.—Orders to be addressed as above.

HENRY F. WILLEY,
(Manager for the late Mr. Vickary, of Exeter, 15 years,)
GAS ENGINEER AND CONTRACTOR.
WORKS: BARTHOLOMEW STREET, EXETER.

Improved Wet and Dry Meters. Gas Apparatus and Gas-Fittings Manufacturer.
Contractor for the Erection of Gas-Works, Gasholders, Station-Meters, Governors, and every article and apparatus appertaining to Gas-Works.

A GREAT SAVING OF TIME, LABOUR, & EXPENSE
IS EFFECTED BY THE USE OF
PRICE'S
PATENT COAL AND COKE BARROWS.

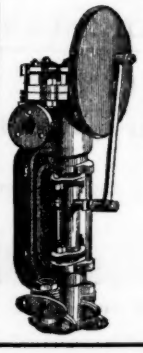
In addition to other testimonials the following has recently been received from one of the largest Gas Companies in London :—

London Gaslight Company, Nine Elms, May 18, 1868.

Dear Sir,—The Patent Coke Barrows are a great improvement, and a saving both in time and labour.
Yours truly,
D. WATSON.

They are in use in the Government, Metropolitan, and several country Gas-Works.
Manufacturers for London and South of England—PRIEST & WOOLNOUGH, KINGSTON-ON-THAMES.
Manufacturers for the Midland Counties and North of England—
THE COALBROOKDALE COMPANY, NEAR WELLINGTON, SALOP.
Manufacturers for Ireland—J. EDMUNDSON AND CO., CAPEL STREET, DUBLIN.
Communications to be addressed to the Sole Agent, R. E. KEEN, 50, Claremont Road, Surbiton, S.W.; or either of the above.

ALEXANDER WILSON & CO., ENGINEERS,
VAUXHALL IRON-WORKS, NINE ELMS, LONDON, S.W.,
MANUFACTURERS OF
IMPROVED DONKEY PUMPS,
INJECTORS, SAFETY-VALVES, STOP-VALVES, AND BOILER MOUNTINGS OF EVERY DESCRIPTION.



Special attention is called to their New Improved Donkey Pumps, which are the best boiler feeders yet brought before the users of steam power. For boilers supplying steam to apparatus other than a steam-engine they are indispensable, and are rapidly supplanting the use of the feed-pump in the engine. They are also largely used in gas-works for pumping ammoniacal liquor, &c., in all parts of the world.

REDUCED PRICE LIST.
Those marked * are double-acting.

Size.	Diameter.	Stroke.	Gals. thrown per Hour.	H.P. of Boiler supplied.	Price.
No. 4	1¼ Inch.	2¾ Inch.	150	10	£6 10 0
5	1½	3	230	15	8 10 0
6	1¾	4	460	30	11 0 0
7	2¼	4	600	40	13 0 0
*8	2¼	4	900	60	15 10 0
9	2¾	6	1200	75	17 0 0
*10	2¾	6	1800	120	19 0 0

LIVESEY FIRE-CLAY WORKS,
NEAR BLACKBURN, LANCASHIRE.
ORLANDO BROTHERS,
MANUFACTURER OF PATENT CLAY RETORTS,
AND EVERY DESCRIPTION OF
TUBULAR GLAZED SEWERAGE PIPES, BENDS, JUNCTIONS, ETC.
FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS.

DRY GAS-METERS IN CAST-IRON CASES,
MANUFACTURED BY
WILLIAM AND BENJAMIN COWAN,
(ESTABLISHED 1827.)
BUCCLEUCH STREET WORKS, EDINBURGH,

Possess a simplicity of construction and facility for repair greater than any yet produced, while the excellence of the material and workmanship, and accuracy of registration, cannot be surpassed. The superiority of their Dry Meters in Tin Cases is also well known.

SOLE MANUFACTURERS OF
ESSON'S PATENT COMPENSATING GAS-METERS.
COWAN'S PATENT SIDE-VALVE GAS-METERS.

EDGE'S AMERICAN PATENT METHOD
FOR
SCURFING RETORTS.

The above improved method having been found to be the most efficacious, expeditious, and economical of any plan at present employed for the removal of the Incrustation from the interior of Retorts, arrangements have been made with the Patentee for working the patent in this country. Particulars and Terms for Licences may be had on application to

E. GODDARD, GAS-WORKS, IPSWICH,

Where the process may be seen in full operation.

ECONOMY IN GAS PURIFICATION.

Mc DOUGALLS'

HYDRATED PEROXIDE OF IRON.

This Oxide is now well known, and has gained at a number of the largest gas-works at home and abroad a decided preference for efficiency and durability. It is free from any mixture of sawdust or other material, every particle being available for use, thus causing the Purifiers to work double the time before it requires renewing, and saves one-third the cost of labour in charging them. It readily takes up sulphur, revivifies rapidly, and lasts longer than any other Oxide in the market. Prices on application to—

Mc DOUGALL BROTHERS, Manufacturing Chemists,

LONDON—11, Arthur Street West, London Bridge, E.C.; MANCHESTER—Riga Street, Shudehill.

BEST AND HOLDEN'S

PATENTS FOR CHARGING AND DRAWING GAS-RETORTS,

WITH CHAMBERS FOR MOUTHS,

REQUIRING NO LUTING.

Gas Engineers are solicited to examine into the merits of this invention before erecting new or altering old retort-houses. It may be seen in action at the Alliance Gas Company's Works, Dublin, where its utility and economy will be clearly demonstrated. Although the saving in labour will be considerable, and quickly return any outlay of capital, there are other and important features strongly recommending its adoption at all gas-works, and which a gas engineer upon examination will at once appreciate.

The Directors of the Alliance Gas Company have kindly consented to give every facility to gentlemen desirous of seeing the invention in operation. Parties, therefore, about to visit Dublin will be so good as to send us their card, and we will furnish them with letters of introduction.

Drawings, &c., may be seen at our Office, and all details explained.

JOHN CHISHOLM, SON, & CO., 44, MARK LANE, E.C.

TO CORPORATIONS, GAS ENGINEERS, AND OTHERS.

HENRY ALDER,

GRANGE METER-WORKS, EDINBURGH,

Begs to intimate that he is the ORIGINAL MANUFACTURER of

DRY GAS-METERS IN CAST-IRON CASES.

The Meters are protected by Registration on the 17th of December, 1864, under the "Copyright of Designs Act."

They are much more durable, and at the same time more easily repaired than those in Tin Cases.

PRICE LIST AND TERMS ON APPLICATION.

Agent for Ireland—Mr. J. FURNESS, 3, Fownes Street, DUBLIN.

N. DEFRIES,

INVENTOR OF THE FIRST SUCCESSFUL

DRY GAS-METER.

210,000 IN USE.

WORKS:

DIANA PLACE, EUSTON ROAD, LONDON.

THE
PROPOSED WATER SUPPLY
FOR
THE METROPOLIS.

Just published, price 6d., by post 7d.,
A LECTURE
DELIVERED AT THE
ROYAL INSTITUTION OF GREAT BRITAIN,
On Friday, April 3, 1868,
BY DR. FRANKLAND, F.R.S.,
ON THE
Proposed Water Supply for the Metropolis.

Just Published, price 1s., by post 1s. 1d.,
EXPERIMENTS ON THE
FLOW OF GAS IN LONG PIPES,
MADE IN THE WORKS OF THE
PARIS GAS COMPANY,
By M. ARSON, Engineer-in-Chief of the Company,
Assisted by MM. MONARD AND HONORÉ.
Translated from the Memoirs of the Society of Civil Engineers of Paris,
By Dr. POLE, F.R.S., Mem. Inst. C.E.

London: WILLIAM B. KING, 11, Bolt Court, FLEET STREET, E.C.

BECK'S
PATENT SLUICE & FIRE COCKS,
HYDRANTS, STEAM-FITTINGS,
PUMPS, FIRE-MAINS, &c.,
Suitable for Public Buildings, Warehouses, and Dwelling Houses.
A competent person sent to receive particulars for Plans and Estimates.

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Mr. H. GORE,
CONSULTING GAS ENGINEER,
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HOPKINS, GILKES, & CO.,
LIMITED,
MIDDLESBOROUGH,
SUPPLY GAS AND WATER PIPES OF EVERY SIZE,
Plain, Turned and Bored, and Coated.
CAST-IRON RETORTS.
Castings for Gas-Works of every description.
EXHAUSTERS.
LONDON OFFICE: 95, CANNON STREET.

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PROPRIETORS OF
BEST GLASS-HOUSE POT & CRUCIBLE CLAY.
MANUFACTURERS OF
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OF EVERY DESCRIPTION.
Orders of any magnitude, for home and exportation, executed with all possible despatch.
N.B.—A quantity of Retorts in stock.
Circulars, 15 in. and 16 in. Ovals, 20 in. by 14 in.
D's, 15×13, 16×12, 18×14, 20×16, 21×14, 24×14.

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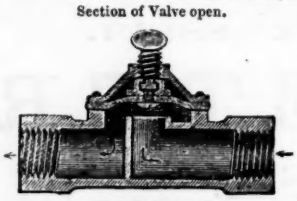
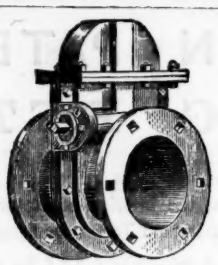
SHORT STREET, LAMBETH, LONDON.

CARTER'S SAFETY GAS-VALVES,
Made to suit every Description of Fittings.
Section of Valve open.



Manufacturers of
WROUGHT-IRON PIPES AND FITTINGS,
SLUICE-VALVES & STOP-COCKS,
STOCKS, TAPS, AND DIES,
CHANDELIERS, PENDANTS, &c.
PATENT MERCURIAL GAS-REGULATORS.



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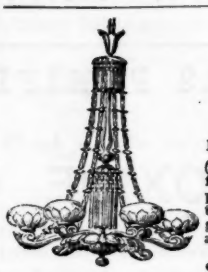
IMPROVED GAS VALVES
WITH WROUGHT-IRON PINIONS
from 2 inches to 18 inches, price 9s. 6d. to 12s. per inch diameter
List of prices, with full dimensions of all sizes up to 36 inches, to be had on application.
These Valves are all proved on both sides to 30 lbs. on the square inch before leaving the works, and are always kept in stock.
Valves made with Outside Racks to order. Also, Screw Water-Valves with Gun-Metal Faces.
B. DONKIN & CO.,
ENGINEERS,
NEAR GRANGE ROAD, BERMONDSEY.



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Manufactory—Broad Street, Birmingham—Established 1807,
MANUFACTURERS OF GLASS CHANDELIERS, GLASS LUSTRES, TABLE GLASS, &c. &c.
ELEGANT CRYSTAL GLASS CHANDELIERS, for GAS, from £4 upwards
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THEATRES, CONCERT, ASSEMBLY, AND BALL ROOMS LIGHTED BY ESTIMATE ON THE LOWEST TERMS.

MATHER AND PLATT,
SALFORD IRON-WORKS, MANCHESTER,
Beg to call attention to their Revised List of Prices of VALVES, TAPS, &c. They also request the notice of Water Companies and Hydraulic Engineers to their IMPROVED SLUICE-VALVES for Water. The Slides have Gun-Metal Facings, are of wedge form, and when screwed down are tight on both sides.

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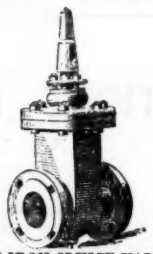
Bore.	Price.
¼ inch	£0 4 0
⅜ ,,	0 4 6
½ ,,	0 6 0
¾ ,,	0 8 6
1 ,,	0 11 0
1¼ ,,	0 14 0
1½ ,,	0 18 0
2 ,,	1 2 6

CAST-IRON STEAM-VALVES.
With Gun-Metal Valves & Seatings

Bore.	Price.
2 inches	£1 2 6
3 ,,	1 17 6
4 ,,	2 15 0
5 ,,	3 15 0
6 ,,	4 17 0
7 ,,	6 0 0
8 ,,	7 5 0
9 ,,	8 15 0
10 ,,	10 10 0
11 ,,	12 5 0
12 ,,	14 0 0



CAST-IRON SLUICE-VALVES.
With Gun-Metal Facings.

Bore.	Price.
2 inches	£1 10 0
3 ,,	2 5 0
4 ,,	3 0 0
5 ,,	3 16 0
6 ,,	4 14 0
7 ,,	5 14 0
8 ,,	6 16 0
9 ,,	8 0 0
10 ,,	9 6 0
11 ,,	10 14 0
12 ,,	12 4 0

Prices and particulars of all other forms and sizes can be had on application.

ROBERT DEMPSTER,
Gas Engineer and Contractor, Rose Mount Foundry, Elland, near Halifax.
R. D. recommends his Fire-Brick Retorts to Engineers and Managers of Gas Companies; they last from 10 to 12 years.

Iron and Fire-Clay Retorts.
Annular and Pipe Condensers.
Scrubbers and Purifiers, all sizes.
Steam-Engines and Exhausters.
Hydraulic Centre-Valves.
Station-Meters and Governors.
Photometers & Pressure-Gauges.
Lamp-posts and Brackets.
Cast-Iron Mains and Syphons.
Wrought-Iron Tubes, Water Tanks.
Wrought-Iron & Cast-Iron Roofs.
Gasholders, Single-Lift or Telescopic.
Gas Castings of every description.
Retort Setters and Fitters sent to all parts of the country.
Wood Sieves for Purifiers.

Plans and Specifications prepared.

GEORGE ORME & CO.,
MANUFACTURERS OF
CONSUMERS GAS-METERS, STATION-METERS, GOVERNORS,
PRESSURE & EXHAUST REGISTERS,
PRESSURE-GAUGES, MINUTE-CLOCKS, PHOTOMETERS,
INDICES FOR GAS AND WATER METERS,
INDICATORS,
FITTINGS FOR RAILWAY CARRIAGES AND LAMPS,
AND EVERY DESCRIPTION OF
GAS, STEAM, & WATER FITTINGS,
ON THE MOST APPROVED PRINCIPLE.

WORKS: PARK STREET, OLDHAM.

PARIS EXHIBITION,

1867.

HONOURABLE MENTION.

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GLOBE METER-WORKS, OLDHAM,

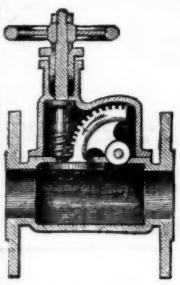
Manufacturers of

STATION METERS for GAS-WORKS, CONSUMERS METERS, GOVERNORS,

GAUGES, PRESSURE AND EXHAUSTER REGISTERS,

EXHAUSTER REGULATORS, &c.

N.B.—The flanges of the plates for the Square Station-Meters are planed so as to ensure perfect joints—guaranteed not to leak.



WARNER'S

NEW PATENT

QUADRANT-MOTION SLUICE or GAS VALVE.

It will be seen, by reference to the drawing, that by this simple method a clear water-way is obtained, the disc being drawn by the screw or worm entirely out of the way; thus all the advantages of the ordinary sluice-valve are obtained at much less cost, and the liability to set fast and get out of order entirely obviated. They are adapted for all purposes for hot or cold water, and equally suited for high or low pressure; and in case of need of repair, a new valve-seat can be applied without removing the body or case of the valve.

Particulars of the Quadrant Valve, also of Hydraulic Machinery, High or Low pressure Cocks, Water Closets, Gas-fitting in all its branches, and general Plumbers' Brass work, can be obtained upon application to

JOHN WARNER & SONS, CRIPPLEGATE, LONDON,

(Brass and Bell Founders to Her Majesty,)

HYDRAULIC ENGINEERS.

SCHOLL'S

PATENT PLATINUM

GASLIGHT PERFECTER.

Extract from Report by Dr. Letheby:—

"The results have been very remarkable, for they show an average increase of 63 per cent. on the illuminating power of the gas. I am of opinion, therefore, that the invention is of great practical value."

Price 1s. each for Fish-tail Burners.

To be had retail of Gas-Fitters and Ironmongers, and wholesale of

JOHN SCHOLL, 41 & 42, BERWICK STREET, OXFORD STREET

LONDON, W.

Terms on application. N.B.—A specimen sent free on receipt of Twelve stamps.

*** Further testimonials from Drs. Frankland and Crooks, showing the great practical value of this invention, will be shortly published.

JAMES MILNE & SON,

GAS ENGINEERS,

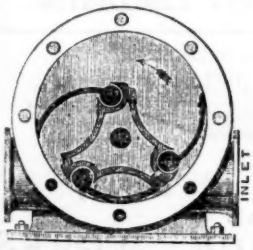
Gas-Meter, Gas Apparatus, and Gasfittings Manufacturers,

EDINBURGH, AND

2, KING EDWARD STREET,

NEWGATE STREET, LONDON.

Station-Meters, Governors, Consumers Meters, Gas Lustres, Chandeliers, Brackets, &c., and every description of Gasfittings and Gas Apparatus.



CHARLES HORSLEY'S

PATENT

GAS EXHAUSTER.

(From 250 Feet to 200,000 Feet per Hour.)

Also,

ROTARY TAR, OIL, AND LIQUOR PUMPS.

For particulars and prices apply to the Patentee,

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SAMUEL CUTLER & SON,

CONTRACTING GAS ENGINEERS, &c.

MANUFACTURERS OF GASHOLDERS, TANKS, PURIFIERS,

AND ALL DESCRIPTIONS OF GAS-MAKING APPARATUS.

Iron Roofs, and General Iron Work. Mains Supplied and Laid.

S. C. & Son supply every requirement for a Gas-Work, and keep in stock Retort Lids, Cotters, Barrows, Scoops, Bolts and Nuts, &c. &c.

PROVIDENCE IRON-WORKS, MILLWALL, LONDON, E.

Now ready, price 21s., bound in cloth, lettered,

THE SIXTEENTH VOLUME

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GREAT CENTRAL GAS COMPANY

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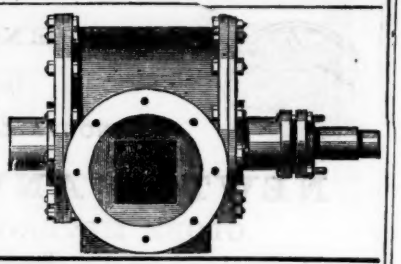

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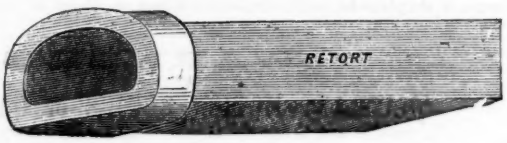

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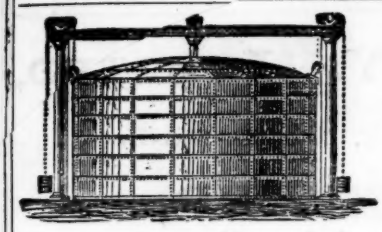

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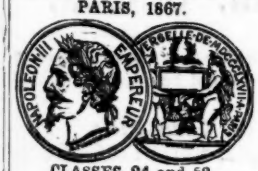

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